

# The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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**Foreign Ironmasters in Russia.**

The Russian Minister of Marine has published a denial of the statement printed by the *Novoe Vremya*, that the Admiralty had entered into an agreement with Cockerill & Co. for leasing to them Nicolaeff Dockyard for a term of years. The contract may not have been actually signed, says *Engineering*, but it is a matter of fact that the subject has been negotiated and is still under consideration by the Russian Government. At any rate, one or two points are beyond the reach of controversy. The Belgian firm have contemplated for some time past the establishment of a works at Nicolaeff, and shortly after the visit to their place of Admiral Shestakoff, the Minister of Marine, in the autumn, dispatched thither representatives who formally applied to the municipal council for the right to hold lands for a term of years for the construction of an engineering works. The proposition was publicly discussed, and so far the Cockerill business is proof against contradiction. A few weeks

aim is to establish a large ironclad fleet in the Black Sea as quickly as possible, and no consideration of sentiment and economy will be allowed to thwart the realization of her designs.

In spite of any exceptional agreement with Cockerill & Co. which Russia may make in order to render herself as quickly as possible the leading naval power in the Black Sea, the general policy of establishing foreign undertakings in Russia itself will be exposed to a vigorous discussion. Already the annual conference of the iron and coal trades of South Russia, assembled at Kharkoff, has forwarded the Government a protest against the course taken by the Minister of Marine in encouraging in any way the erection of an establishment by Cockerill, and it is expected that the larger and more influential general conference assembled at St. Petersburg will pass the same resolution. Concurrently with this and the attacks of the Russian press on the older arrangement with Cammell & Co., at Kolpino, the *Novosti* has opened fire on a proposition of the Minister

says that this view is expressed, not because the committee reported in favor of the Armstrong scheme, but because their statements are less open to criticism, and on account of the notorious corruption that has always marked the relations between the official world at St. Petersburg and the Aboukhoff Works ever since the concern started operations.

**Ericsson's Submarine Torpedo Gun.**

A little more than two months ago the Delamater Iron Works, of New York, completed and shipped to England one of Captain Ericsson's improved submarine torpedo guns, of which we present engravings. Of all examples of submarine artillery this gun probably ranks first as regards efficiency, and its several details are ingenious throughout and well worth careful examination.

Briefly described, the gun, as our engravings show, consists of three cast-iron sec-

tion plug is in position the bolts *a* are screwed down and everything is then ready for firing. The torpedo consists of  $\frac{1}{4}$  inch steel, and is made up of sections riveted together. A cast-iron chamber is screwed to the forward end for holding the explosive material. Into the end of this chamber a steel plug or firing-pin is inserted, cone-shaped inside, as shown in Fig. 6, so that in case the projectile strikes at an angle it will not glance off. Its rear end is furnished with several points to strike suitably arranged primers. By the arrangement adopted the striking of all the primers is insured, and the firing of the explosive charge in the torpedo cannot fail unless the whole number of primers should miss, and it is hardly within the range of possibility that all should miss when the front end of the firing-pin strikes a vessel or other body attacked with the impact due to the momentum of the projectile. The latter, exclusive of the explosives chamber, is hollow, and the rear half is of somewhat smaller diameter than the bore of the gun, being,

is readily heard through the bore of the gun, indicating that the valve is in place. The latter offers very little resistance to pressure from within the gun, will be shot away by the projectile as the latter begins to leave the gun, and will generally be broken into pieces. The central portion, being of soft material, will offer so little resistance to the firing-pin that there will be no danger of premature explosion of the charge in the torpedo. The gun itself can be lowered from the side of a man-of-war and then fired, or can be fixed into the bow of a vessel. In the former case either of the valves *E* and *E'* (Fig. 6) may be used, while in the latter case the valve *E* only is employed, a large swinging iron valve, however, being then arranged at the bow of the vessel so that it can be made to shut the mouth of the gun immediately after firing. This swinging valve is operated from within by suitable mechanism and prevents all but a small quantity of water from entering. When a shot is to be fired this valve, of course, is swung away from the muzzle, and

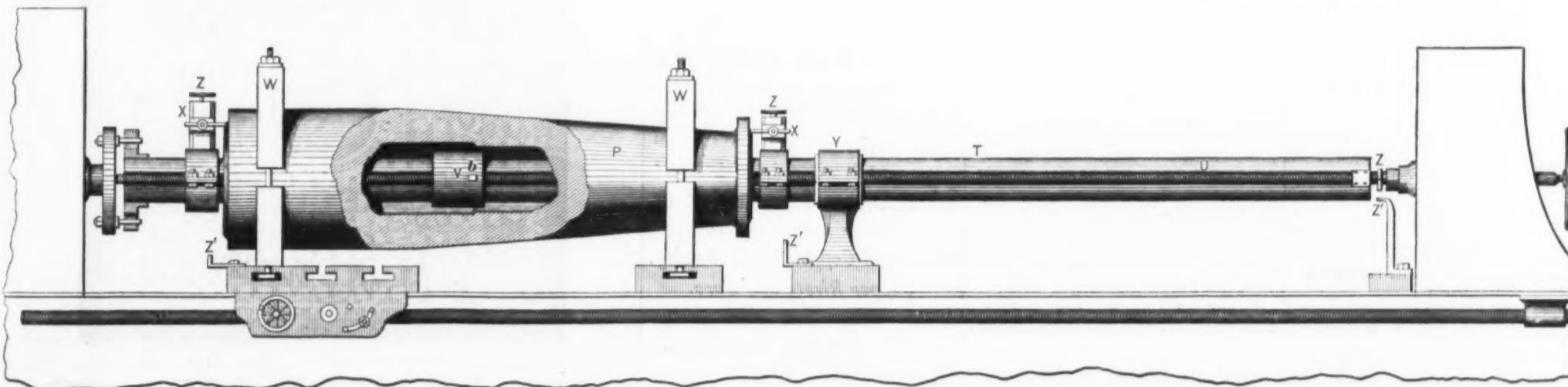


Fig. 1.—Boring and Facing the End Section of the Gun

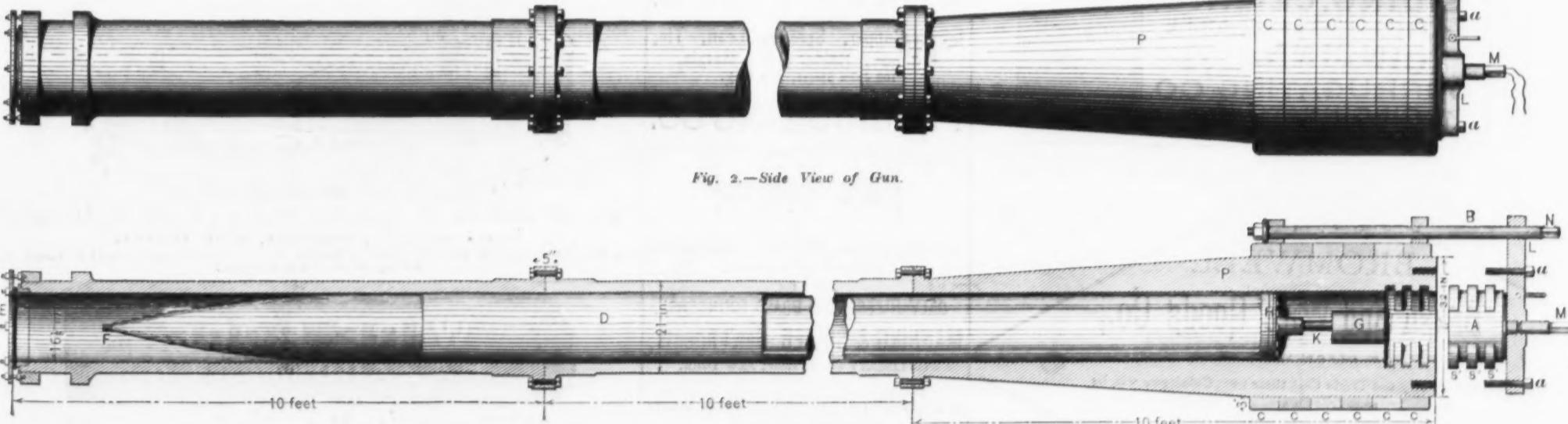


Fig. 2.—Side View of Gun.

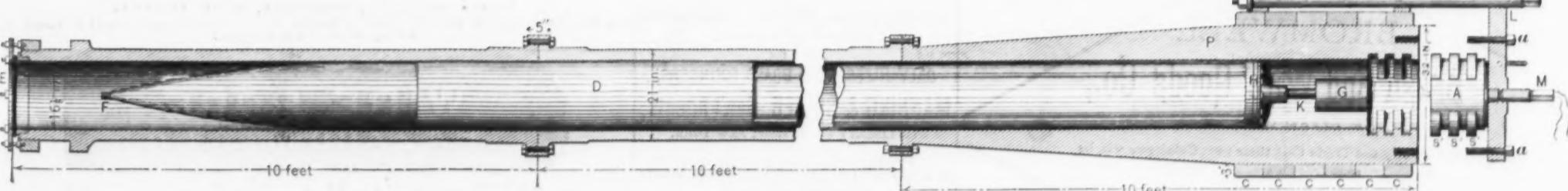


Fig. 3.—Longitudinal Section, Showing Torpedo, Powder-Can, &c., in Place.

ERICSSON'S SUBMARINE TORPEDO GUN, BUILT BY THE DELAMATER IRON WORKS, NEW YORK.

ago the manager of Cockerill's arrived at St. Petersburg to conduct negotiations for establishing a basis for Government support, and it was during these that the suggestion was made that the firm, instead of building a new works, should take over bodily Nicolaeff Dockyard. Of course no proof exists as to the course of these negotiations beyond what is verbally current in the higher naval circles at St. Petersburg, but we can say that in those circles the contradiction of the Minister of Marine is taken to mean only that the contract has not been actually signed. At first sight it may seem curious that a large dockyard should be handed over to a foreign company, but the proposition under discussion admits of plausible argument in support of it. Of late years Russia has built large workshops at Nicolaeff and filled them with costly machinery. She, however, possesses no adequate staff of practical and technical engineers to place in charge of it to produce the extensive results the aims at. Such a staff can only be supplied from abroad, and it appears wiser to the Russian Admiralty to allow Cockerill to work Nicolaeff Dockyard for it than for the Belgian firm to erect a second series of new workshops at Nicolaeff, outside the dockyard, and allow the first series, inside it, to remain idle. The adoption of the latter course would be in the end the more expensive one for Russia, while, what is more important still, a considerable time would be lost in erecting the new shops, which, in the present condition of affairs in the East, the Government begrudge. Russia's chief

of War to offer favorable terms to Messrs. Armstrong, Mitchell & Co. to establish a gun foundry in Russia. The *Novosti* publishes side by side the opinions of two commissions appointed by the minister to report respectively upon the Armstrong scheme and the condition of the Aboukhoff Works, at St. Petersburg. The Aboukhoff Steel Works were established years ago as a private State-aided concern for the manufacture of heavy steel ordnance, and, after collapsing, was taken in hand by the Government and kept going by a nursing process which has proved very expensive and repeatedly involved the Government in discreditable scandals. The erection of a new works by Armstrong would compete seriously with, and perhaps put an end to, the Aboukhoff one, and consequently, as might have been expected, the two committees reported one against the other. In our own country instances are not unknown of hasty opinions and ridiculous recommendations formulated by committees, but publicity exercises a wholesome check upon such official extravagances as are disclosed by the *Novosti*, where the facts as well as the opinions of the two committees run counter to one another, and the conclusion is forced upon the reader that either one of the two committees did its work badly and reported from interested motives, or else that both were bad in this respect. Judging from the generality of the opinions expressed, the commission appointed to examine the Armstrong project appear to have been the fairest and the least unbiased. *Engineering*

tions, each 10 feet long, having a bore of  $16\frac{1}{2}$  inches, and bolted together in the manner indicated. The breech section tapers, as shown, to give increased strength, and is reinforced by six steel rings, *C*. Between the projectile *D* (Fig. 3) and its projecting charge is a piston, *H*, fitted gas-tight to the bore. The box *G* which contains the projecting charge of powder is of a diameter much smaller than the bore of the gun, and is attached to the piston *H* by a wooden supporting-rod, *K*. The powder-case, it will thus be seen, occupies only a small portion of the space left in the chamber of the gun between the piston and the breech. The breeching *A* is furnished with thrust collars *S S'*, whose arrangement and functions will be readily understood from the illustration. The plug is supported by a sliding-bar, *B*, through the intervention of a swinging crosshead, *L*, and when withdrawn from the gun can be swung to one side, as in Fig. 5, by means of a long lever, *Q*. When in this position it is held in place by a small pawl, readily enabling the loading of the gun to be performed. After loading the breech-plug is swung back into place, pushed into the gun, as shown in the side view, Fig. 2, and one-sixth of a turn is given to it by means of a smaller wrench, *R*, locking the thrust collars. These collars were turned to steel gages and then scraped by hand to a fit that would allow them simply to turn, but not shake in the lease. Through the center of the breech-plug pass the wires for exploding the charge in the tin can *G*, a small dynamo being used for this purpose. After the

moreover, furnished with longitudinal steady-fins. To counteract the tendency of the front and heavy end of the torpedo to sink, Captain Ericsson supplied an ingenious device, shown in the detail view, Fig. 7. It is in effect a rudder, *R*, placed on the top of the torpedo and forced upward by a spring, *S*. It is hinged at one end, and, accordingly, offers no obstacle to the insertion of the torpedo into the gun. One of the steady-fins mentioned is here shown, being marked *E*. The torpedo, as will be seen, occupies nearly the whole length of the bore of the gun in front of the piston *H*.

To the muzzle of the gun a frangible valve is secured which serves to exclude water from the bore of the gun before the discharge of the projectile, but which is destroyed by the latter upon firing. This valve, as it is called, is shown at *E*, Fig. 3, and consists essentially of a rubber disk held in position by a ring firmly bolted down. In Fig. 6, which is an enlarged view of the muzzle end of the gun, we show both this valve and another valve *E'* which serves practically the same purpose, but is inserted from the breech by means of a rod. This valve is made of thin cast iron and is furnished with a central orifice closed by a rubber diaphragm. Along its circumference are arranged projecting springs or hooks which catch into a rabbet provided around the interior of the muzzle of the gun and prevent the water from forcing the valve back. The clicking noise made by the springing of these hooks into the rabbet

the valve *E* is depended upon to prevent water from entering.

Having thus briefly outlined the main features of the gun, it may not be without interest to some of our readers to give attention to some of the methods adopted in its construction. The work naturally required extreme nicety in its execution, and being rather heavy afforded ample opportunity to bring into play "shop wrinkles." Throughout the work was carefully planned and finally executed. The main points to be considered were the boring and fitting together of the different sections, the shrinking on of the steel rings *C*, and the cutting off of the thrust rings *S S'* (Fig. 5). For the first of these operations we refer our readers to Fig. 1, which shows the breech section *P* of the gun in the boring mill. It was found that in placing a 10-inch boring-bar of sufficient length to bore the 10-foot gun sections on the centers of the boring mill there was a sag of fully  $\frac{1}{2}$  inch. This, of course, would not answer for the work in hand, and accordingly a bar of about twice the length of the breech was put on the centers, with a third bearing at *Y*. In this way no difficulty from sagging was experienced, and an unusually straight bore and a fine surface were accordingly obtained. The boring bar was arranged with a traveling head, *V*, and the gun section remained stationary while boring. In this way both ends of the work could be faced at the same time that the cut was running through. The feeding of the

(Concluded on page 7)

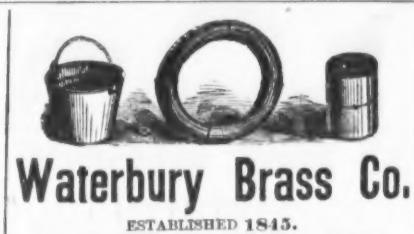
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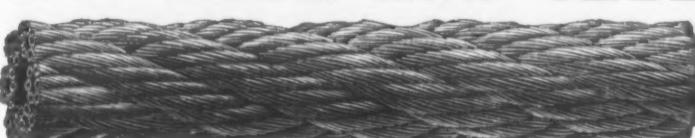
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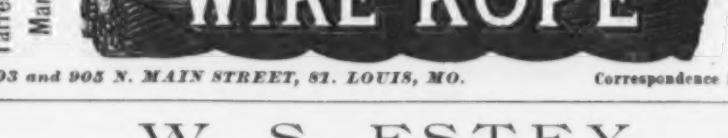
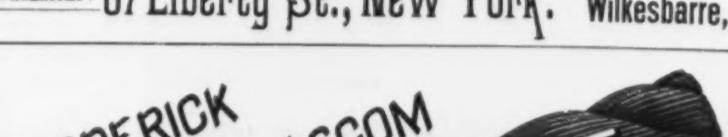
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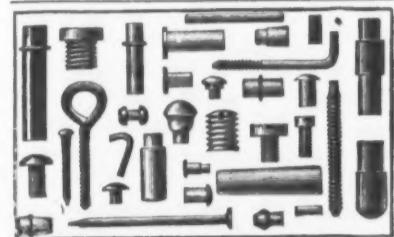
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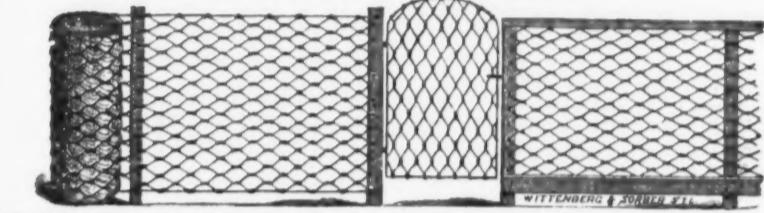


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The Sums Directly Involved in the Passenger War.

Mr. Albert Fink has given some interesting figures concerning the interests directly involved in the fight between the Baltimore and Ohio and Pennsylvania railroads:

The fight involves all the other roads, and many lines having nothing whatever to do with the war have to pay a penalty, while innocent stockholders are made to suffer most severely. The passenger earnings of all the roads affected by the cutting of rates by these two lines amount to \$50,000,000 a year.

The Baltimore and Ohio wanted to get the use of the Pennsylvania road from Baltimore to New York. The Pennsylvania road were willing to give Mr. Garrett the use of this line permanently, but refused to give it temporarily—that is, until the Baltimore and Ohio should complete its rival lines and get into New York, a fully-equipped competitor with the Pennsylvania road.

At first the Baltimore and Ohio did have such an arrangement with the Pennsylvania, but that road concluded to break the arrangement in 1884, when they discovered, as they claim, a disposition on the part of the Baltimore and Ohio to parallel their line. The question who is right in the quarrel is difficult to decide. Of course each road ought to have the right to control their own property at least as the public is properly served.

I think that railroads should establish judicious and equitable tariffs and stand by them. They should not be allowed to make unreasonably low rates to injure other or rival roads, or merely to fight lines with a view of forcing them to yield to their demands, and then when the point has been gained to put up the rates again. Altogether it is a difficult matter to regulate tariff by legislative enactments.

The proper way is to submit all questions under dispute to arbitration, to be settled on principles of equity, and to protect innocent parties against unjust losses. It is not lawful for a man to set his house on fire to spite a neighbor, at the risk of consuming a whole city.

The trunk railroads have formed an association to protect themselves against the evil effects of railroad wars. The trunk-line compact lately made has this for its object. It provides that all questions arising between parties to the contract that may lead to war shall be settled by arbitration. The Baltimore & Ohio are a party to this agreement so far as freight is concerned, but, unfortunately, not in regard to passenger traffic. The trunk-line contract in this instance has had the good effect of keeping the war confined and preventing a general cutting of rates. But for this there would have been a complete demoralization of passenger rates between New York and the West. The total earnings of the roads would have been affected, and each road would have sold tickets at rates to suit itself. The majority of the trunk lines, by acting together, instead of fighting, present a solid front against cutting rates, and they will prevent a general passenger war. The total passenger earnings of the New York trunk lines are \$26,000,000 a year, \$17,000,000 of which are local earnings, and \$9,000,000 are on business that goes to and comes from other roads. Now the earnings involved in the present controversy amount to no more than \$800,000 a year on east and west bound passengers—that is, between New York and Chicago, St. Louis and Cincinnati—over the seven trunk-line roads. The interests of the Baltimore and Ohio road in this controversy do not exceed \$125,000 a year, even when rates are maintained, and this is the amount they are fighting about at the risk of distributing the \$26,000,000 earnings of the other roads. Some way ought to be found to settle these disputes without imperiling the business of the country and unsettling securities and public confidence.

It is almost criminal that so small an interest should be allowed to injuriously affect so great a proportion of the country's wealth. In regard to the loss imposed on the weaker lines, that is regulated by the system the pool has organized. The Erie and West Shore roads will be protected. The loss to each will be small in case of a prolonged war, because the receipts are pooled and divided among all the roads, and thus the weak are protected by the strong lines—all helping each other and sustaining the business interests of the country.

**Cleaning New Rubber Corks and Tubing.**—New rubber corks and tubing are always coated with more or less sulphur, and perhaps also some of the "filling" that is often added to them (which is often powdered soapstone). Mere washing in water will not remove this coating, especially from the inside of tubing. It is best gotten rid of by boiling the goods in a solution of one part of sulphide of sodium and two parts of caustic soda in 10 parts of water. The tubing should be lifted out of the liquid occasionally, and carefully reimmersed, so that new liquid will pass throughout its bore. After having been thoroughly boiled in this manner the goods are carefully washed in water. If the tubing is previously treated with warm water and thoroughly kneaded or beaten, so as to loose the coating adhering to the inside, the above described cleaning process will be much more thorough.

**The lead industry in the North of England** is probably the only one of the mineral industries in which any improvement has been noticeable over a large part of the year 1885. In 1884 and 1885 there was a very considerable reduction in the production of British lead. There was also a considerable decrease in the imports of lead from Spain, because of the cholera outbreak; and there has been concurrently an increase in the export of lead, especially in China. One of the largest of the lead-mining companies in the North of England sold lead, at the worst period of 1885, as low as £10. 5/8 per ton in March last; but before the end of July—it's financial year then ending—it made sales at £12. 4/10, and this advance in price was

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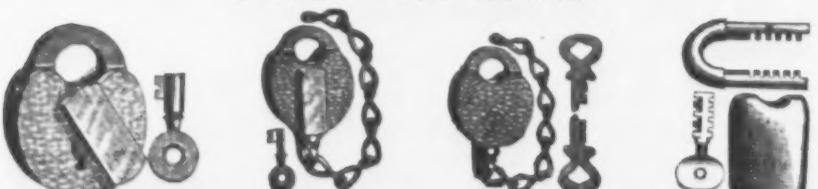
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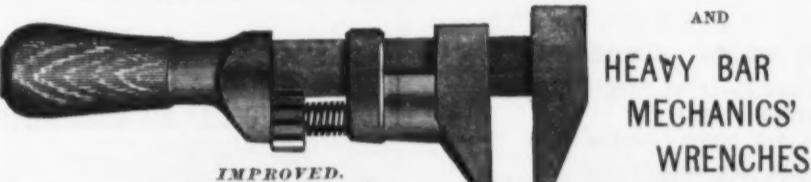
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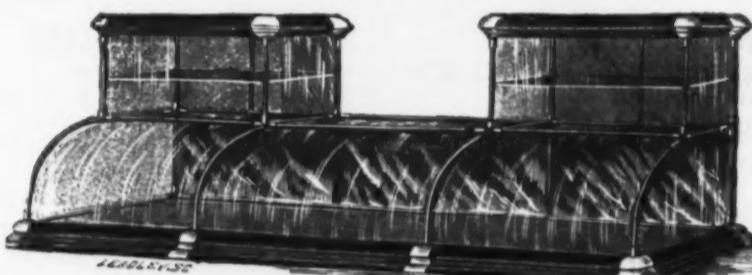
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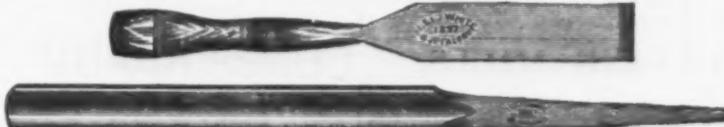
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Special catalogues of all kinds of Roller  
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FIG. 120.



FIG. 129.



FIG. 130.

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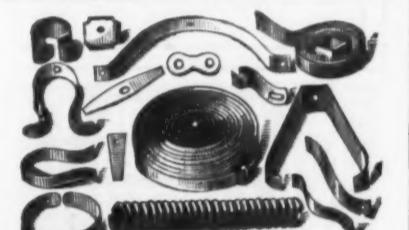
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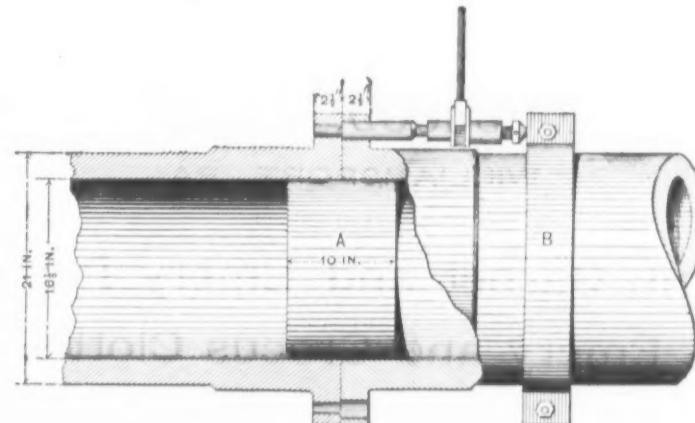
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(Concluded from page 1.)

side, about 2 inches apart, was then arranged around the ring, and water was projected close to the bottom joint of the rings, cooling the lower edge of each ring, and thus causing the other part to draw down to where the metal was already sufficiently cool to pinch the gun section. After all the rings had been shrunk on the section was again put in the turning lathe and the rings were turned and polished.

The gun as turned out at the Delameter Works was eminently satisfactory in all respects and was accepted by the English Government, after careful inspection. It was



Ericsson's Submarine Torpedo Gun.—Fig. 4.—Reaming the Flanges of the Gun Sections.

bar was removed and a special cast-iron head was bolted to the face-plate of the mill. By means of this and of two small angle plates a small facing-arm was introduced into the breech, readily enabling the cutting of the rings. The other two sections of the gun were bored and faced with the same bar and facing-arms X X. After boring and facing each section special cast-iron centers were inserted into the ends and the several sections were put into a turning lathe for turning the flanges and the extreme end

shipped to the Royal Arsenal at Woolwich, England, on the steamship Greece, of the Monarch Line, during the latter part of November of last year. We understand that it is now on exhibition at that place.

## English Shipbuilding in 1885.

From all available accounts it would appear that the year 1885 will long be remembered as one in which the English shipbuilding trade has suffered the greatest depression. On the Clyde there were launched 241 vessels of 193,458 tons, accompanied with 296,854

tons in 1884, showing a decrease of 103,396 tons. In 1879, the last period of depression, the output was 174,750 tons—18,708 tons less than in the present year. In 1877 also the output was less than that of 1885, but it was considerably affected by the long struggle between masters and men, which lasted for months, so that for the greater part of the year there was no work in the shipbuilding yards. In 1876 the serious depression was unaffected by strikes, and the output was 18,634 tons less than in the present year. The following table gives the amount of tonnage launched on the Clyde during the last 16 years:

Year.	Tonnage.	Year.	Tonnage.
1862	102,458	1877	169,110
1864	296,854	1879	174,824
1866	419,654	1875	211,924
1868	391,934	1874	262,930
1870	341,022	1873	232,595
1872	341,114	1872	230,347
1874	174,750	1871	196,329
1876	222,353	1870	189,401

The returns from the various shipbuilders show clearly the extent of the depression. One noticeable feature in the returns is the steadily increasing use of steel and the greater favor with which it is regarded by both shipbuilders and shipowners. The following table clearly shows this:

Year.	Total tonnage.	Year.	Total tonnage.
	of steel.		of steel to total tonnage.
1879	147,750	18,000	10%
1880	341,114	42,000	12%
1881	341,022	66,600	19%
1882	391,934	108,554	27%
1883	419,654	129,651	31
1884	296,854	132,070	45
1885	193,458	92,677	48

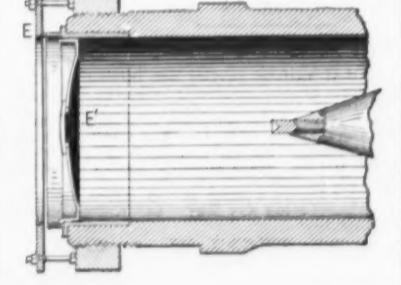


Fig. 6.—Enlarged View of Muzzle End of Gun, Showing the Two Muzzle-Valves.

half of the flange joint had been reamed in the position in which it was drilled, the reamed hole was not only much more likely to be square with the face of the flange, but also formed a guide for the reamer in reaming the second half of the joint. This will be understood from an inspection of Fig. 4. The ratchet is here shown backed up with a wrought-iron strap, B, clamped on the gun. To save time in drilling, a cast-iron ring was made with the

other feature is the great increase in the working pressure of boilers which has taken place in the last two years, pressures of 150 and 160 pounds being now quite common. Triple-expansion engines are rapidly replacing the old compound form of engine, and their success is very gratifying. At least two firms on the Clyde—Messrs. Denny & Co., Dumbarton, and Messrs. Rankin & Blackmore, Greenock—have been encouraged to go a step further and to produce quadruple-expansion engines, one large set of which the former are now fitting into a steamer, while the latter are fitting their patent engines to a large yacht. The latter engines have six cylinders, three cranks, and the boilers will work at 180 pounds

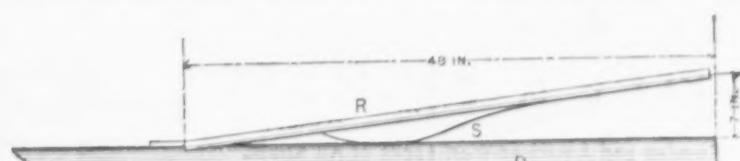


Fig. 7.—Detail of Torpedo, Showing Rudder.

holes laid out, and a steel bushing was fitted to guide the drill. This ring was kept in place by another cast-iron ring made to fit the bore of the gun and of the template ring. After drilling the first hole a steel plug turned to fit the drill size was inserted to prevent the template ring from turning. This plan was also adopted for reaming the holes, as shown in Fig. 4. The bolts through the flanges holding the gun sections together were made a driving fit.

In Dundee the year has been one of gloomy depression; two of the yards is virtually closed; one of the yards is only six vessels on hand, four of which are

pressure. The engines of Messrs. Denny are of the two-crank tandem arrangement, and by means of additional patents it is intended to still further simplify and improve this type of engine. These and other less important improvements go far to relieve the year of its barrenness, so far as shipbuilding and engineering are concerned. The increased economy of such engines, the decreased weight and smaller consumption of coal, cannot but have the effect of increasing the demand for ships so engined, and thus relieve somewhat the prevailing depression.

In Dundee the year has been one of gloomy depression; one of the yards is virtually closed; two are on short time, and there are only six vessels on hand, four of which are



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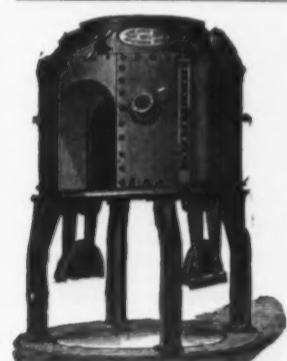
We are informed that various parties are infringing upon the widely known Letters Patent granted originally to George F. Weymouth, for an improved Hay knife.

The characteristic feature of the invention is a curved blade, provided with saw-tooth cutters, and furnished with suitable working handles. It is our purpose to prosecute all infringers of our patent, and we have already commenced one suit, which is nearly ready for hearing, and are about commencing suits against other parties.

All manufacturers are hereby warned of our rights, and the public are cautioned against purchasing any Hay "Saw Knives" which are not of our genuine manufacture.

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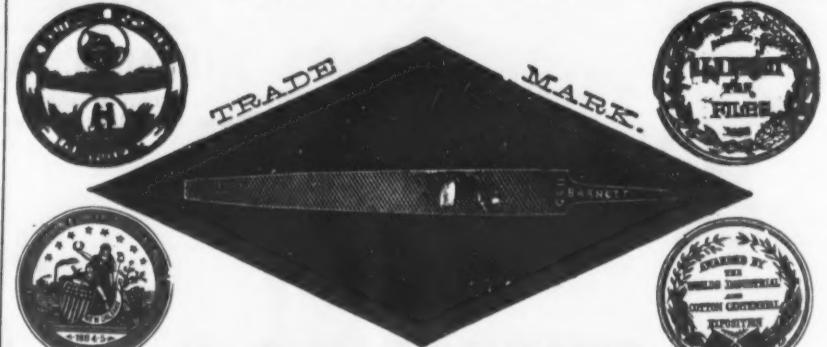
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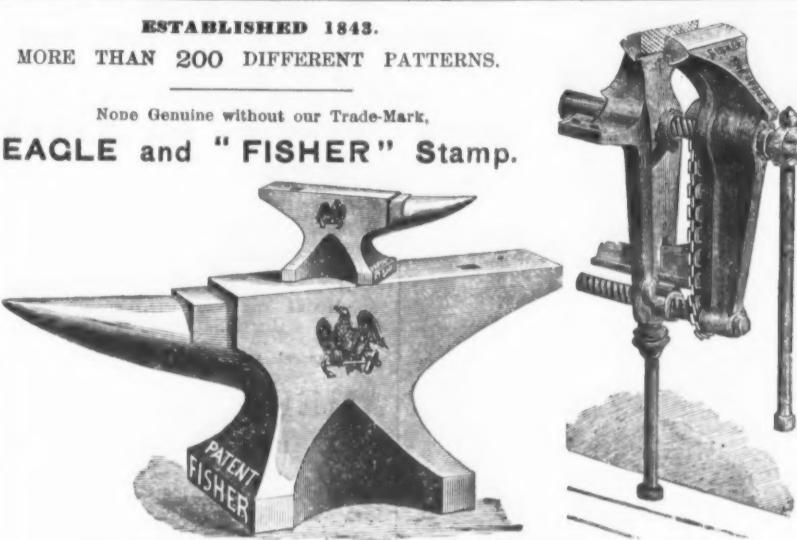
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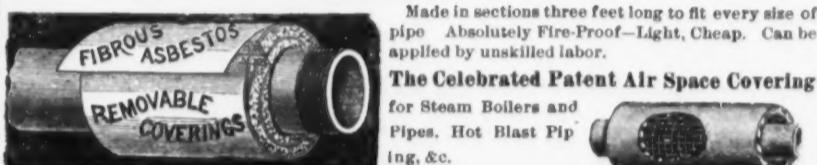
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stock boats. During 1885, 13 vessels of a combined tonnage of 7358 were launched, as compared with 12 vessels of 12,062 tons last year. In Aberdeen the number of vessels launched was fewer than usual, and the tonnage was lower than at any time since 1879. The vessels launched were seven in number, of 6246 tons, as compared with seven vessels of 7661 tons in 1884, and 16 vessels of 11,628 tons in 1883. The outlook for the ensuing year is disheartening in the extreme. In Leith shipbuilding has also been in a depressed and unremunerative condition throughout the year. The report of shipbuilding on the Wear shows the severity of the existing depression. Three years ago Sunderland held high position as a shipbuilding port, being second only to the Clyde; but since then this industry has suffered to considerable extent, partly owing to circumstances of a local nature. In 1882, the most prosperous year, a tonnage of 212,464 tons was registered, and in 1883 this total was only reduced by 151 tons; but in 1884 the downward career of shipbuilding on the Wear commenced, which was largely accentuated by strikes, more especially the one in the marine-engine building trade, which cost the employers something like \$600,000 and the employees \$1,000,000.

One of the Tees several of the yards have been closed for some months. The shipbuilding trade on the Mersey during the year has been comparatively slack, and so far as present appearances go the prospects of the present year are not encouraging. At Barrow-in-Furness the year's work has been by far the smallest ever experienced, only one yard being really engaged in shipbuilding—viz., the Barrow Shipbuilding Co., who have launched four vessels of 5958 gross tonnage. Not a vessel of any kind has been launched since May, owing to the very serious fire which occurred last August, when the whole of the engineering shops were completely destroyed. On the Tyne there has been a decrease of over 20,000 tons during the year, the total number of vessels built having been 105, with a gross tonnage of 102,998, as compared with 124,221 tons in 1884. At Bristol the shipbuilding trade has for some time been insignificant; the tonnage during the year has only been 1500, as compared with 903 tons in 1884. At Belfast the gross tonnage of vessels launched during the year is 33,378 tons.

### English Letter.

(From Our Regular Correspondent.)

LONDON, JANUARY 11, 1886.

THE OUTLOOK

has not altered very much during the week, but there has been a pretty general resumption of operations and a commencement of arrangements for the now current year. In the course of this and next week matters will get into full swing again, and the quarterly meetings of the iron, &c., trades having taken place this week, traders generally will be in a better position to estimate the possibilities of the near future with greater accuracy than just now, when everybody and everything are but emerging from the chaos of the holidays and the confusion of stock-taking. At the moment, therefore, some little uncertainty prevails as to prices and the run of orders, but it may be admitted that there is a hopeful feeling abroad. Much of this tone is doubtless due to the steady improvement reported from the United States. That change is valuable morally, but that it is also of very material worth is amply demonstrated by the Board of Trade returns for December, during which month greatly enlarged quantities of pig iron, tin plates, hardware and cutlery, old iron, unwrought steel, &c., were exported by us to your market. Even in its early stages, therefore, the improvement has been of real practical utility to us, so that one need not wonder that all our eyes are upon your market. There are certain other indications from South Africa, India, &c., which betoken coming changes for the better, so that on the whole our hopefulness is not ill-founded, and those who prefer moderate optimism have fair warrant for their views. Probably more would have been done at the works but for the very inclement weather, the snowfall and frosts having been much more severe than for many years past.

THE AMERICAN EXHIBITION IN LONDON has been postponed from May, 1886, until May, 1887, as you will have been informed by telegraph. All things considered, the postponement is wise and sagacious, for the great Indian and Colonial exhibition will this year prove the center of attraction, and would have largely overshadowed the American undertaking. As the latter gives promise of being a big thing, it is better that it should wait a year and have the field all to itself rather than be forced on in the face of a rival show possessing all sorts of Royal, Government and other influential patronage and support.

THE LABOR QUESTIONS alluded to in some of my communications are now taking more serious shapes, and in some cases threaten to end in strikes or lockouts. The following summarized statements give an accurate representation of the present position of these agitators, &c., in such trades as are likely to interest your readers. The arbitrator of the South Staffordshire Mill and Forge Wages Board has just given his decision, which is: "That puddlers wages shall continue at 7/3 £ per ton till January 16 inst.; that from and after that day puddlers wages shall be 6/9 £ per ton for a period of three months; that wages of mill and forge men shall be regulated by the above rate in the same manner as heretofore; that from and after the aforesaid period of three months the above award shall be subject to one month's notice, to be given at the end of any week, by either side of the board." The Iron Trade Association has resolved to give notice to the engineering workmen of the whole country of a reduction of wages of 7 1/2% on the rates paid in the early part of 1887. The reasons alleged are the depressed state of trade and the higher cost of production. At Belfast the men have already accepted the reduc-

tion; at Birmingham and Liverpool it will act after January 22; elsewhere on and after January 31. On Wednesday the quarterly certificate of the average price of No. 3 Cleveland pig iron was issued by the accountants employed by the Cleveland Ironmasters' Association and the Cleveland Miners' Association. The certificate states that the average price for the quarter has been 32/2.99, against 32/8.16 for the preceding quarter—a decrease of 5.17 d. £ per ton, equal to a reduction of about one-twentieth of a penny £ per ton in the miners' wages. At Sheffield the engineers and ironworkers will be reduced in wages by from 7 1/2 to 5%. At the same place the well-known edge tool firm of Ward & Payne have asked their men to accept a reduction of 15%, failing which they will no longer make tools for stock. The men say they will resist. All the men engaged in the shipbuilding yards on the Tyne have turned out on strike against a reduction of wages. It is feared that the example will be at once followed by the men working on the Wear, and that no fewer than 9000 men will be thrown idle in the midst of a population already supported in part by distress funds. The Sunderland Town Council has resolved to memorialize the Local Government Board for leave to borrow £7000 to be expended in providing work for the unemployed workmen in the town. It is proposed to construct a promenade and carriage drive along the sands at Roker—a seaside resort. At present there are upward of 10,000 persons receiving food from the Borough Relief Committee, and it is feared that, should the threatened strike in the shipbuilding trade not be averted, the supply of food will almost cease, the tradesmen and public men declaring that they will stop contributions. The fears of an extension of the distress were partially confirmed on January 7, when the workmen connected with the Boiler Makers' Society who are employed in the shipbuilding yards came out against the proposed reduction. At Birmingham there is much suffering among the unemployed, and a meeting is arranged to to-day to "organize the men into a labor army, which shall conquer in justice and utterly overcome starvation and suffering. No longer," continues the handbill, "shall innocent children starve and strong men lie idle." The quarrymen of North Wales are on strike, and the Lancashire cotton spinners have decided to make another reduction in addition to the drop of three months ago. In parts of Scotland there are serious disturbances among the coal miners and other men who have no, or only part, work. On January 8 a meeting of about 5000 unemployed, convened by the Glasgow Trades Council, was held in Glasgow Green, when resolutions were adopted declaring that great destitution prevailed in Glasgow and that the present measure of relief is totally inadequate, and that the wealthier classes be appealed to. Committees were appointed to carry out the object. One speaker condemned the "labor test" for decent artisans, and said it should be only applied to loafers. The majority of the meeting were young men. A meeting of the operatives engaged in the South Staffordshire and East Worcester tube trade was held on January 8, when it was decided to continue the strike at the works where employers insisted upon enforcing 10% reduction in wages and the hour system. The employers state they are compelled to reduce wages in order to compete with other manufacturers both at home and abroad. In several other branches of industry the rates of remuneration are being rearranged. The employers almost universally would prefer to have the hours of labor lengthened, but the men, especially those employed in the engineering trades, are so bitterly opposed to the extension of their present hours that the masters have not felt able to face the real issue direct in the face.

### THE IRON MARKET.

The new year has hardly opened with those prospects of encouragement which were generally anticipated just prior to closing down for the Christmas and New Year holidays. Some little difference of opinion is manifested as to the prospects, but the preponderance is in favor of a more hopeful feeling, the lowness of prices notwithstanding. Any change that comes ought to be for the better. On the other hand, however, it is reported that lots have been bought at prices several shillings lower than those which ruled about five or six weeks ago. As to work in hand nothing for special mention has transpired during the week, and generally matters remain in *status quo*. Scotch warrants have been easier in Glasgow, closing on Thursday at 40/4 1/2, and dullness has prevailed at Middlesbrough with 32/3 for No. 3. In Staffordshire transactions have been practically carried over until after next week's quarterly meetings, while at Barrow a firm and good tone has for the most part ruled, mixed numbers being from 44/6 to 45/. In Swedish brands there has been a fair demand for the better grades with a guaranteed percentage of silicon and a low percentage of phosphorus; but prices are 5/- below what they were a year ago, and the prospect of an increase is not in view. The common class of Swedish pig continues to be a drug on the market, and wire is still in a depressed condition, with prices regarded as wholly unremunerative. Both the Indian and the Levant markets are stagnant because of war rumors and of military operations. In fencing-wire and in galvanized sheets business has been quiet, though not more so than before the holidays. Heavy manufactured iron and ordinary brands of merchant iron are for the most part dull, with prices unchanged and without much prospect of large orders to take the place of those being worked off. The Commissioners of the American Exhibition, to be held next year at Earl's Court, London, have just placed some contracts for the buildings in the hands of Belgian iron firms; the other work is being chiefly done across the Atlantic. For old material there is a steady demand, cheap parcels not being procurable, and there is a reasonable expectation of a rise in prices. At present the figures are as follows: Old double-headed iron rails from 54/- to 55/-; No. 1 heavy wrought scrap, 45/-; old iron boiler tubes, 42/6 @ 45/-; old cast iron, 38 6/- @ 40/-; old flange rails, 52/6 @ 53 6/- f.o.b., London or other British ports. Freights.—

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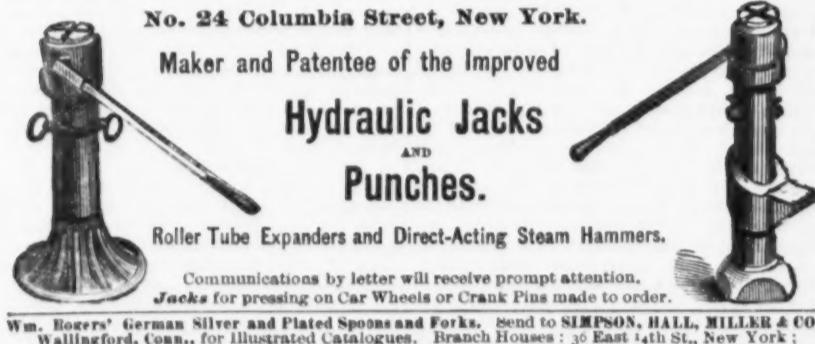
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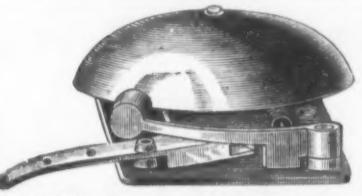
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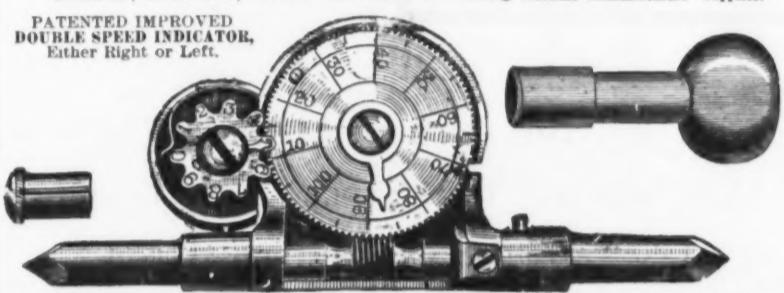
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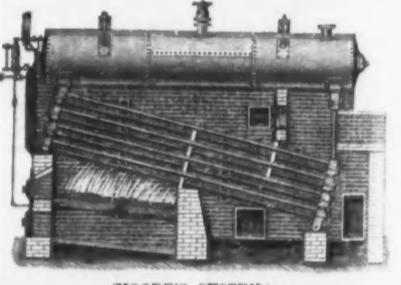
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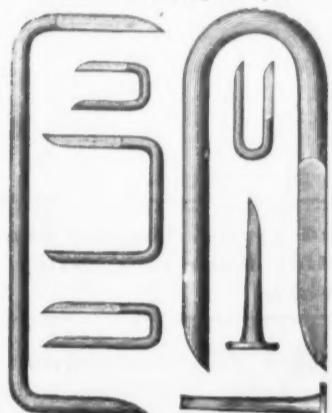
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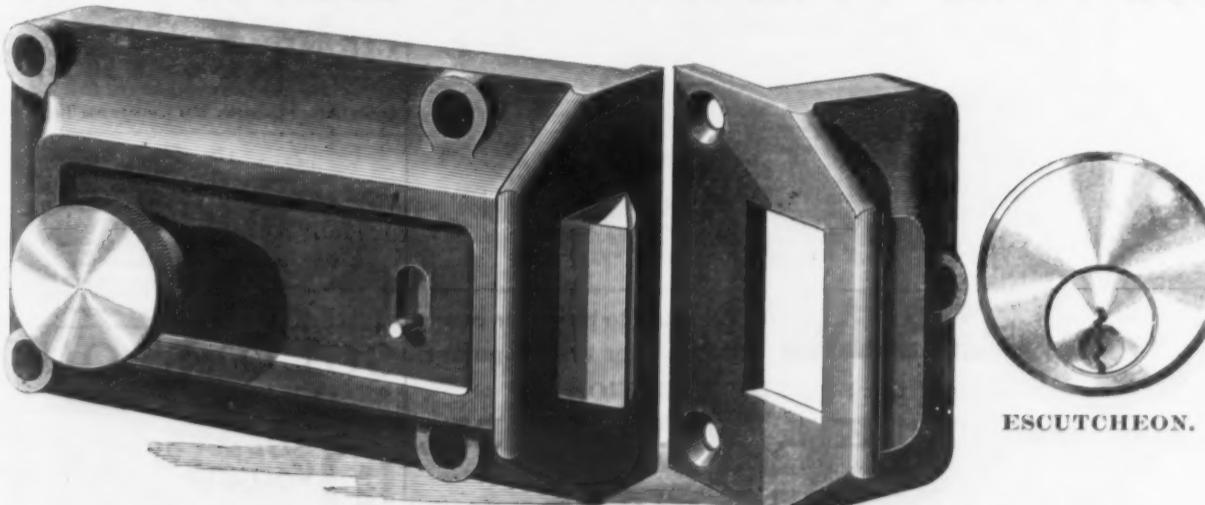
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These remain unaltered for the most part. With regard to the operations of the Australian "ring," it is reported that the struggle between the "ring" and the opposition is drawing to a close, or that, at least, the 7/6 rate has been condemned to an early extinction. Glasgow to New York is still 7/6 @ 10/12 ton for pig iron by ordinary steamers. Steel.—This is quiet in all departments, although all things considered some of the works in the North are tolerably well employed. Steel sleepers are being found a source of much consolation just now, and some of the firms engaged in their production have orders in hand to keep them going pretty well for the next four or five months. Old leaf spring steel is steady at \$25.00 to 55. f.o.b. London or other British port, and lots are more or less scarce. Steel Rails.—No change can be chronicled in this department. The Victorian order for 40,000 tons of steel rails, with accessories (and not, as has been reported elsewhere, 40,000 tons of accessories), is still the subject of much conversation. A portion of the order, viz., about 2500 tons, has gone to Cannell & Co., Sheffield, and at the association price it is believed.

## SCOTCH PIG IRON

is quiet, but the depressed feeling produced by the publication of the unfavorable annual statistics has to some extent been lightened by the continuance of good reports from the United States.

THE BOARD OF TRADE RETURNS for December, and consequently for the complete year 1885, have just been issued, and present several features of more than ordinary interest. On the whole year the imports decreased by £15,940,235 and the exports by £19,993,835.

The totals of imports for the month, for the year, and for the two preceding Decembers and the two previous years, are:

	Imports.	Exports.
December.	Year.	Year.
1885..... £31,143,598	£213,631,407	£213,631,407
1884..... 33,073,970	288,025,242	288,025,242
1883..... 39,871,131	245,603,932	245,603,932

The totals of the exports for the month of December in 1885-84-83, and also for the three years, are:

	Exports.	Year.
December.	Year.	Year.
1885..... £17,304,428	£21,717,196	£21,717,196
1884..... 17,840,102	23,496,035	23,496,035
1883..... 18,971,102	28,590,216	28,590,216

The following are the totals of the exports of iron and steel for the last month in each of the three last years, and for the three years:

	Iron and Steel Exports.	Year.
December.	Year.	Year.
1885..... £1,569,768	£21,717,196	£21,717,196
1884..... 1,779,961	23,496,035	23,496,035
1883..... 2,067,090	28,590,216	28,590,216

As compared with December, 1884, the exports of iron and steel for the month show a decrease of £191,199. For the year as compared with 1884 the decrease is £2,778,899.

TO THE UNITED STATES during the month of December the principal lines of export were as under:

Articles.	Month of Dec., 1885.	Month of Dec., 1884.	Month of Nov., 1885.
Alkali, cwt.	254,700	290,210	333,199
Hardware and cutlery, £.	36,018	19,971	24,464
Iron—Pig, tons	83,703	15,312	10,604
Bar, angle, rod, &c., tons	1,065	1,373	275
Railroad, all tons	308	308	35
Hoops, sheets, plates, &c., tons	996	1,676	1,410
Tin plates, tons	16,551	15,867	18,417
Cast or wrought, tons	179	83	256
Old iron, tons	3,897	717	1,945
Steel, unwrought, tons	2,078	1,565	2,121
Linen, all sorts, tons	1	1	52
Steam engines, £.	1,178	4,776	4,713
Other machinery, &c., £.	30,654	25,160	28,346
Special return—Iron rails, tons	477	197	396
Steel rails, tons	302	302	35

## TIN PLATES.

In London there has been very little business done this week, and though the market may be described as steady and fairly strong, it is undoubtedly quiet, and unless buyers show a little more life between now and the end of the month some of the makers will be very poorly off for work. I quote for good ordinary brands of IC coke 14/ @ 14/6 f.o.b. Liverpool. At Liverpool the new year does not open very auspiciously so far as the tin-plate trade is concerned, and the question is as to whether or not the combination to reduce the output of plates will continue for the half or whole of this year. When this point has been finally settled we shall see some considerable business done at either higher or lower prices. There have been several good lots of coke tins placed at 13/9 @ 14/1, and any further lots they may be offering at these figures will be taken up at once. There has not been so much doing in either Bessemer or Siemens steels with coke finish this week. After the few sales made at 14/ @ 14/6 IC respectively for the two qualities there has been no further receding in prices, and it is to be hoped that the next turn will be in an upward direction. The demand for charcoal tin plates as well as terne tin plates is still of a limited character, and prices are not by any means firm. The figures for the former vary from 16/6 to 18/6 IC, and for the latter from 13/ @ 14/6 IC. Coke tin wasters are in fair demand at about 13/.

## THE HARDWARE TRADES.

In London it is as yet too near the opening of the year to speak definitely of any alteration in the business situation, but from what I hear there is a more hopeful spirit about, and if orders are no more numerous than they were a month ago that is not considered as unsatisfactory, seeing that the first half of January is usually a quiet period. Many firms are still in the midst of stock-taking, and those who have completed the operation are too busy in settling up their books to order with any freedom. The export business, on the whole, is no worse than it was two or three weeks ago, but that is not saying much. Australia has sent some fairly good order sheets, and so has South America, for certain classes of goods, but the Eastern markets remain very unsatisfactory, and are likely to remain so until the rate of exchange takes a decidedly favorable turn.

At Birmingham the new year's business opens very quietly, but the hopeful feeling which manifested itself before Christmas is rather strengthened than otherwise by the more settled aspect of affairs abroad and the fact that in many cases last year's returns have come out better than was expected. As manufacturers' travelers have only just started on their journey home orders at present are rather meager, but London is proving a better customer in some lines than was generally expected from recent reports and experience. There are a good number of inquiries about for export, and American buyers now in this country are placing orders for guns, fancy goods, jewelry and saddlers' ironmongery with considerable freedom. The last Cape mail has brought some respectable indents, and Australian requirements are well sustained for all kinds of railway stores and material. At Wolverhampton Bayliss, Jones & Bayliss, Victoria Fencing and Engineering Works, have in hand a large contract for the Indian Government. The contract consists of work for the Indian Telegraph Department, and the iron and most of the accessories pertaining to the work will be made in the town or district. The delivery extends over the first half of this year and the value of the contract is set down at in round figures £50,000. At Sheffield the new year is scarcely sufficiently advanced to form any clear judgment of the prospects of the country trade. Travelers are only just on the road, and the business booked has chiefly come in through the medium of letter orders. Typical representatives of the home trade in cutlery, edge tools and small ware, however, are well satisfied with the indications which they have already had, and have been able to make a fair start with the new orders. The leading Bessemer steel makers have been doing considerable business at advanced rates, ranging up to a rise of 7/6, consequent on the upward turn in the quotations for hematite and spiegeleisen, the deliveries in some cases extending as far into the future as six months. The export department continues to be marked by more cheerful accounts from the United States and some of the Australian colonies, while several substantial lines in high-class razors and pocket-cutlery have recently been received from India.

## Latest Legal Decisions.

## FRAUDULENT CONVEYANCES.

M., who was threatened with an attachment by C., a creditor, conveyed all of his real estate to McK., to defeat C. in getting his claim, which M. contended was unjust. The grantee in taking the deed agreed to pay C. whatever was found to be due him. Shortly after the conveyance was made M. died, and D. took out letters of administration. The creditors required the administrator to sue McK. to recover the property for their benefit, some of whose claims arose after the making of the deed. The suit was brought and the trial court rendered judgment for the administrator for the benefit of those creditors whose claims were in existence when the deed was made, but denied the right of subsequent creditors to the remedy. In this case—Bassett vs. McKenna—both sides appealed to the Supreme Court of Errors of Connecticut, where the claims of all the creditors were sustained. Judge Carpenter, in the opinion, said: "1. This conveyance was in fraud of creditors. The agreement of the grantee to pay the debt of C. did not relieve the transaction of its fraudulent character. A creditor is not bound to accept a verbal promise to pay his claim as a substitute for visible attachable property. 2. It is the duty of executors and administrators to include in the inventory of the estate the property of the decedent which he had conveyed in fraud of creditors when it is needed to pay debts. In this respect there is a close analogy between executors and administrators and trustees of insolvent estates and receivers of corporations, where we have recognized the right to recover. 2. In this case the defendant participated in the fraud, for he knew the debtor's intention, and agreed to carry it out. So, the conveyance being fraudulent and being set aside, the equities of the subsequent creditors are inferior to those of the fraudulent grantee, and they will share in the distribution of the property recovered. Where the conveyance is made in good faith, and under circumstances which show that there was no intention to defraud any creditor, there seems to be some difficulty in perceiving how the subsequent creditors can make out any right as against the voluntary grantee through the equity of the antecedent creditors; but where the conveyance is clearly fraudulent it is perfectly reasonable to hold that all of the creditors should participate in the recovery."

## BANKING—FRAUD OF AGENT—STATUTE OF LIMITATIONS.

B. deposited in 1865, with the cashier of a bank, certain bonds for safe-keeping, and died in 1866. He was given a certificate of deposit. Upon the distribution of his estate in 1871 new certificates were issued to the interested parties, and H. was given one for \$2,400. In 1874 H. sought to withdraw his bonds, but was told that they had been sent to Pittsburgh for safe-keeping, and repeatedly the cashier promised to get them. Interest on all of the bonds deposited was promptly paid, but in 1876 it was discovered that years before the cashier had pledged all of these bonds for a debt of the bank. H. demanded a settlement of the bank, but failed to get it, and in 1882, shortly less than six years from his discovery of the fraudulent appropriation of the bonds, he brought suit against the bank, which defended on two grounds: 1. That it was not liable for the acts of the cashier in taking the bonds and pledging them. 2. That the statute of limitations had run against the claim. The trial judge ruled in favor of the bank on the first point, and the plaintiff carried the case—Hughes vs. First National Bank of Waynesburg—to the Supreme Court of Pennsylvania, where he succeeded. Judge Paxson, in the opinion, said: "1. There may have been in the origin of the matter no liability upon the bank, for there is no trace of any authority

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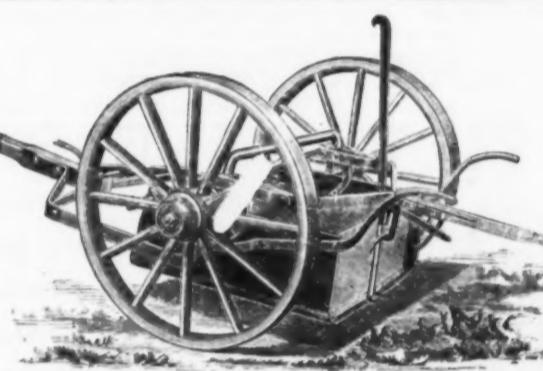
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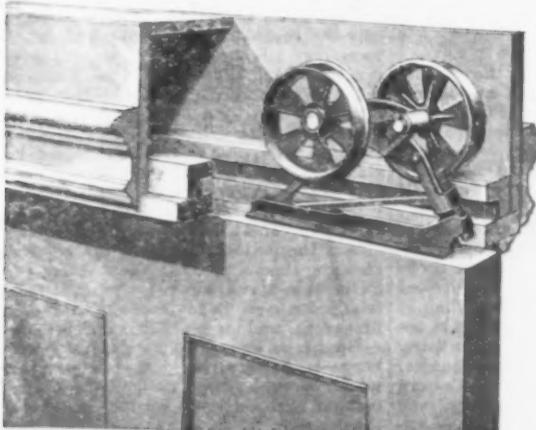
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from the Board of Directors to receive such deposits. But when the cashier, who had taken the bonds for safe-keeping, used them as a pledge for the debt of the bank, the matter became a transaction of the bank, the fraud of the cashier became the fraud of the bank, and the concealment of the pledge became the bank's concealment. Besides, these bonds were sold by the pledges and their proceeds were applied to the debt of the bank. The bank cannot retain the fruits of the crime of its agent and repudiate his act. No authority is needed for so plain a proposition. 2. The fraud was not discovered until 1870; it was carefully concealed until that time, and the conversion for which this action is brought was not known until then. The right to sue began then, and as the action was brought within six years from that time it was brought in time. It may be that there were circumstances of suspicion calculated to alarm a prudent man; but if this is conceded by us that does not help the bank. It cannot take advantage of its own wrong. Holding the property of the plaintiff and having fraudulently converted it to its own use and concealed the fact from him, we will not hold the plaintiff to knowledge which he did not possess."

INSURANCE—INDEMNITY—THE CONTRACT

## DEFINED.

An action was brought to prevent the Farmers' and Mechanics' Mutual Benevolent Association, which had a membership entitled to "death benefit" not to exceed \$5000, to be paid out of assessments to which there was no legal claim, this payment being voluntary, membership ceasing on the failure to pay, on the ground that the association had not complied with the insurance laws. The defense set up was that the association was not engaged in insurance. In this case—State vs. Farmers' and Mechanics' Mutual Benevolent Association—the Supreme Court of Nebraska decided against the association. Judge Reese, in the opinion, said: "A contract by which one party, for a consideration, promises to make a certain payment of money upon the destruction or injury of something in which the other party has an interest, is a contract of insurance, whatever may be the terms of payment of the consideration or the mode of estimating and securing the loss, and although the object of the insurer in making the contract is benevolent and not speculative."

## PARTNERSHIP.

Thompson and two others, in 1857, became partners under the name of Davey, Thompson & Adler, and in 1881, the term running out, a fresh agreement on like terms was entered into. In the following year Thompson became heavily indebted to a savings bank, and its trustees recovered against him a judgment of £26,000 and interest, and issued a writ of *ejectus* under which possession was taken of one of the places of business of the firm for the purpose of realizing the share of Thompson in the firm business. Thompson thereupon mortgaged his interest in the partnership to secure the judgment, and the sheriff was withdrawn from possession. Eighteen months later the firm was dissolved, and a month afterward Thompson was adjudicated a bankrupt. The mortgagees then issued their writ and the question arose: From what time were the plaintiffs entitled to an account of the partnership assets and property as against the other partners? The plaintiffs claimed at least from the date of the mortgage, and the partners contended that the date of this writ was the proper time. In this case—Whetham vs. Davey—in the English Chancery Division, Judge North ordered that the account be taken from the date of the dissolution. "If there had been no dissolution, I should have ordered the account to be taken from the date of the writ. It seems to me to be impossible that the account should be taken before the plaintiffs became assignees, as is claimed for them. Partnership accounts are sometimes settled for years, and the assignee cannot be allowed to disturb any settled account."

## The Production of Pig Iron in the United States in 1885.

The American Iron and Steel Association have just completed their returns of the production of pig iron. The following tables give the returns in detail:

## Production According to Fuel Used.

Fuel used.	Production Tons of 2000 lbs. (Includes spiegeleisen.)		
	First half of 1885.	Second half of 1885.	Total for 1885.
Anthracite	708,217	751,178	1,454,395
Charcoal	196,291	218,553	414,844
Bituminous	1,361,908	1,414,937	2,675,955
Total	2,150,816	2,879,053	5,029,869

## Production of Pig Iron in Certain Districts.

Lehigh Valley	222,656	250,307	473,963
Schuylkill Val	104,195	100,715	204,841
Al. & Geor.	62,705	64,573	127,278
Shen. Valley	217,490	211,675	429,165
Allegheny Co.	101,514	105,481	206,995
Pitts. 940	277,940	307,756	585,696
Ohio	178,844	220,055	408,899
R. I. R.	4,809	12,148	16,957
Mahoning Val	130,966	115,282	246,248
Hocking Val	16,052	34,429	50,481
Mis. bituminous	97,550	82,960	180,549
H. R. charcoal	10,061	7,957	18,018
Mis. charcoal			

## Production of Pig Iron in Certain Districts.

Pennsylvania	555,798	642,302	1,198,100
Maryland	2,629	4,245	6,897
Virginia	71,731	79,605	151,336
Georgia	7,000	30,127	37,127
Alabama	86,892	92,948	179,840
W. Virginia	35,965	37,045	73,010
Kentucky	15,989	20,048	36,037
Tennessee	62,734	64,292	127,026
Ohio	262,999	272,946	535,945
Indiana	3,594	8,040	11,634
Illinois	141,476	186,501	327,977
Michigan	6,388	5,008	11,396
Wisconsin	6,358	23,295	29,653
Colorado	5,481	5,481	10,962

## Production of Charcoal Pig Iron.

Maine	440	440</td

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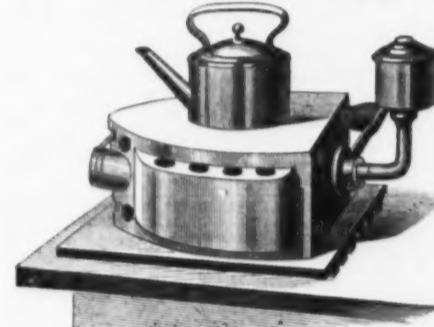
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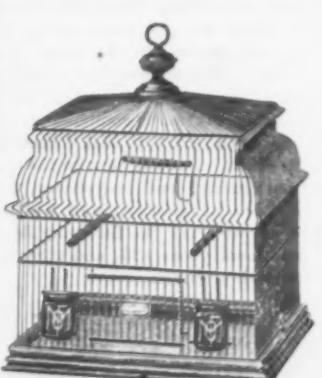
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**The Rise and Fall of Prices.**

The following highly interesting tables  
from the report of Mint Director Kimball on  
the production of the precious metals in the  
United States for 1885, exhibit the rise and  
fall in prices of the principal commodities in  
the New York market, with an average of  
the whole period between 1845 and 1850, and  
then compare with this average the prices of  
1882 and the three subsequent years:

Average Prices in New York.

	For the six years 1845-1850	For the year 1882	For the year 1883	For the year 1884	For the year 1885
Flour, super., bbl.	\$5,450	\$2,938	\$3,410	\$2,850	\$3,205
Rye flour, bbl.	3,597	3,247	3,723	2,691	3,677
Corn meal, bbl.	3,205	3,918	3,622	3,636	3,040
Wheat, N. th'n, bu.	1,167	1,254	1,206	1,016	970
Oats, bushels	730	833	780	694	709
Oats, bushels	116	575	593	585	591
Corn, bush.	662	727	611	616	578
Coal, anth., ton.	5,495	4,355	3,350	4,106	3,825
Coffee—Rto, lb.	.074	.098	.104	.109	.063
Java, lb.	.083	.130	.157	.125	
Copper—Pig, lb.	.176	.185	.160	.141	.112
Sheathing, lb.	.233	.280	.240	.200	.160
Cotton, upland, lb.	.084	.118	.101	.109	.082
Fish—Cod, cwt.	2,851	6,574	6,311	5,297	4,274
Mackerel, bbl.	10,469	18,700	17,529	21,234	20,419
Hops, lb.	1,096	1,120	1,080	1,145	1,141
Iron, Scotch, ton.	31,672	26,153	21,480	21,693	20,693
Lead, pig, cwt.	4,217	4,909	4,310	3,825	3,925
Leather, lb.	.147	.237	.232	.237	.221
Molasses, N. O. gall.	.281	.587	.529	.512	.567
Nails, cut, lb.	.043	.041	.039	.038	.022
Wrought, lb.	.104	.058	.052	.051	.055

Comparison of Prices of 1881 and Subsequent Years with the Average Prices of 1845-50, Expressed in 1000.

	For the year 1881	For the year 1882	For the year 1883	For the year 1884	For the year 1885
Flour—super., bbl.	\$814	\$726	\$629	\$525	\$588
Rye flour, bbl.	980	909	757	749	1,022
Corn meal, bbl.	832	1,155	1,625	1,351	1,137
Palm, red lead, cwt.	5,759	6,300	5,846	5,400	5,400
Pork—Mess, bbl.	11,299	17,040	16,990	16,111	11,415
Prune, bbl.	9,299	11,410	14,510	14,821	10,670
Hams, lb.	.084	.110	.139	.131	.108
Lard, lb.	.073	.118	.100	.083	.068
Rice, cwt.	3,485	5,900	6,400	6,100	5,384
Salt, Liv'n'l, sack.	1,352	750	710	700	732
Sugar, Cuba, lb.	.072	.073	.068	.053	.033
Loaf, lb.	.097	.069	.091	.074	.069
Tallow, American, lb.	.075	.083	.078	.071	.066
Naval stores—Tur- pentine, gall.	.366	.515	.428	.324	.343
Rosin, bbl.	.832	2,115	1,625	1,351	1,137
Palm, red lead, cwt.	5,759	6,300	5,846	5,400	5,400
Pork—Mess, bbl.	11,299	17,040	16,990	16,111	11,415
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# The Iron Age

AND  
Metallurgical Review.

New York, Thursday, January 28, 1886.

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The office of this journal is removed to 66 and 68 Duane Street.

## The Production of Pig Iron in 1885.

The American Iron and Steel Association has accomplished a feat unparalleled in the history of industrial statistics by issuing in the third week of January complete returns of the production and stocks of pig iron, and its officers are to be heartily congratulated. Of course such prompt work is impossible without the co-operation of producers, but the credit of so deeply interesting them that they respond immediately is certainly due to those who manage the work. When the distances are taken into consideration, and allowance is made for the delay incident to interruptions of postal communication at the present season, it will be readily conceded that the rapidity of the work is almost marvelous. The trade will appreciate this, since its interest in statistics decreases very rapidly with every day's delay. The array of tables, which we print elsewhere in full, will be widely quoted as one of the most convincing and striking proofs of the sound condition of our pig-iron industry. It was quite generally understood that our make had been quite heavy during 1885, and in fact Mr. Swank only recently estimated that it would closely approach that of 1884. The complete figures now show that the production was only 59,744 net tons less than 1884, while the apparent consumption of domestic iron was, in consequence of a decrease of stocks by 176,488 tons, a little greater than in 1884, when some stocks accumulated. This state of affairs is due entirely to the greater activity during the second half of the year, as is evidenced by the increase of the production in that period over the first six months of the year. On June 30, 1885, stocks had increased by 100,000 tons, although the production of the first six months was only 2,150,816. That accumulation was swept away, and an increase in stocks was made to the extent of 176,000 tons more, although the output had been 2,379,053 net tons for the second half of the year. In other words, the apparent consumption of domestic pig in the first six months of 1885 was 2,050,900 tons, while in the second half of that year it was 2,655,457 tons, or a gain of, roughly, 600,000 net tons. This is certainly an exceedingly favorable

showing, and if the rate of consumption now reached is maintained during the current year 1886 will witness the greatest record of home production, providing the imports of foreign pig can be kept at the present rate. As compared with recent years, commencing with the boom year 1880, the production of pig iron in 1885 presents an exceedingly favorable showing when the depression in all branches of business in the greater part of 1885 is considered. The figures are as follows:

Years.	Net tons.	Gross tons.
1880.....	4,393,414	5,835,191
1881.....	4,611,564	6,144,254
1882.....	5,178,129	6,623,333
1883.....	5,146,972	6,495,510
1884.....	4,589,613	6,097,968
1885.....	4,529,869	4,044,596

The production of pig iron in 1885, classified according to the character of the fuel used, is given in one of the tables. As compared with 1883 and 1884 it was as follows:

Fuel used.	1883.	1884.	1885.
Bituminous.....	2,689,650	2,544,742	2,675,685
Anthracite.....	1,995,598	1,986,453	1,454,380
Charcoal.....	571,736	458,418	399,844
Total.....	5,146,972	4,589,613	4,529,869

The production of pig iron in 1885, classified according to the character of the fuel used, is given in one of the tables. As compared with 1883 and 1884 it was as follows:

Fuel used.....

Bituminous.....

Anthracite.....

Charcoal.....

Total.....

change of gauge of the Southern roads will do much to restore this drooping industry to prosperity.

The most encouraging feature in the statement issued by the American Iron and Steel Association is that of pig iron unsold, in the hands of manufacturers or their agents, not required for the consumption of those who produced it. At the average rate of consumption during the whole of the year the anthracite furnaces carry about two to three weeks' stock, while that of the bituminous furnaces is equivalent to a consumption of about the same period. Of course iron will accumulate during the next few weeks, but it will be readily seen that producers are in the most excellent position to face the future calmly, and need not be disconcerted by any temporary lull. The Scotch iron trade is to-day carrying more than double as much stock as we are in the entire country. More than half of what we have is charcoal iron, which needs to be held in larger quantity because a good deal of it is piled away in inaccessible localities. Taken all in all, we question whether a stronger position statistically for the producers of pig iron could well be imagined. We know that for certain purposes—for instance, for rails and cars—the demand in 1886 is going to be greater than it was in 1885, and we have every indication of larger buying in other lines, so that the future is a bright one, comparatively speaking.

In the analysis accompanying the tables we find the following remarks, which will be read with interest: "The anthracite figures require to be accompanied by the explanation that nearly all of the pig iron that has in late years been produced in anthracite furnaces has really been made with a mixture of anthracite and coke, very little being made with anthracite alone. In 1884 only 246,570 net tons were produced with anthracite alone, and in 1885 only 277,913 net tons were produced. In each year we produced very much less pig iron with anthracite alone than with charcoal, although in both years the production of charcoal pig iron sensibly declined as compared with 1883 and other years back to 1880."

The anthracite furnaces have lost ground relatively in 1885, the principal decline being in Pennsylvania in the Schuylkill and in the Upper Susquehanna valleys, as the following figures will show:

## Anthracite, Net Tons.

Year.	Lehigh.	Schuylkill.	Upper Susquehanna.	Lower Susquehanna.
1872.....	449,663	262,225	127,900	159,306
1875.....	290,350	123,184	71,731	79,717
1880.....	544,987	306,928	168,128	217,889
1881.....	560,190	306,049	125,785	218,329
1882.....	600,398	342,701	201,367	300,240
1883.....	575,987	337,493	165,639	337,749
1884.....	481,867	278,578	148,303	419,493
1885.....	478,958	204,841	127,278	459,166

The steady gain of the Lower Susquehanna Valley since 1875 must be specially noted. New York contributed to the anthracite pig iron tonnage 215,998 tons in 1884. It dropped to 145,475 tons in 1885. New Jersey, too, exhibits a decrease from 82,935 net tons to 73,667 net tons in 1885.

In pig iron produced with bituminous coal or coke Pennsylvania shows an improvement from 1,084,011 net tons in 1884 to 1,108,100 net tons in 1885. This increase is nearly entirely due to the greater quantity made in the Pittsburgh district, Alleghany County, which was carried from 487,055 net tons in 1884 to 585,666 tons in 1885, or within a few thousand tons of its best record, in 1883—592,475 net tons. The Shenango Valley has fallen off from 246,056 to 206,995 net tons in 1884, while the furnaces grouped under "Miscellaneous Bituminous Furnaces" in Pennsylvania have increased from 350,870 net tons to 405,409 net tons. In Ohio the Mahoning Valley bituminous furnaces produced only 236,078 tons in 1885, against 246,288 tons in 1884, while the Hocking Valley, which had fallen so far behind in 1884, recovered from 24,126 tons then to 50,481 tons in 1885. Hanging Rock remained about the same, 64,781 and 68,837 tons respectively. Illinois maintained the high position gained in 1884.

The South has again recorded considerable progress in 1885, and has reached a higher position than even in 1883. The following are the amounts in net tons:

States.	1881.	1882.	1883.	1884.	1885.
Alabama.....	98,081	112,765	172,465	189,664	207,488
Virginia.....	83,711	87,731	152,967	157,483	163,782
Tennessee.....	87,406	137,602	133,963	134,597	69,007
West Virginia.....	66,409	73,220	88,398	55,231	161,199
Kentucky.....	45,973	66,532	54,629	45,052	37,533
Georgia.....	37,404	42,440	45,564	42,652	32,934
Maryland.....	48,756	54,528	49,153	37,349	17,359
Texas.....	3,000	1,391	3,281	5,140	1,848
North Carolina.....	800	1,150	—	435	1,790
Total.....	471,540	577,275	696,260	657,509	712,885

This increase has taken place almost entirely in the furnaces using bituminous coal or coke as a fuel. We give below the figures for the years 1884 and 1885, in net tons:

States.	1884.	1885.
Alabama.....	130,216	140,605
Virginia.....	142,654	151,134
Tennessee.....	55,231	69,007
West Virginia.....	117,593	130,029
Kentucky.....	35,040	27,127
Georgia.....	37,170	32,846
Maryland.....	2,985	6,867
Total.....	517,087	566,978

The charcoal furnaces again show a decline for the whole country, although some Southern States have made an advance. Alabama, which produced 59,448 net tons in 1884, rose to 7

## THE IRON AGE.

of figures giving the nationality of the farmers who come to till our soil, which will be found interesting:

*Farmers Immigrated.*

Country.	1884.	1885.
England.....	1,89,9	1,401
Ireland.....	1,527	1,456
Scotland.....	356	344
Denmark.....	1,451	810
Germany.....	18,735	11,265
Italy.....	2,450	1,138
Norway.....	2,288	724
Sweden.....	1,519	1,042
Switzerland.....	1,464	1,004
Quebec and Ontario.....	7,320	4,696
Total.....	42,050	27,585

A comparison of the two tables shows how largely the number of laborers predominated over the farmers among the immigrants from Great Britain. It proves that for nearly one of the former class one of the latter comes to us from Germany, and that the men who come to us from Canada are chiefly farmers. Another large class are the servants, of which Ireland furnishes nearly one-half, 10,000 out of 24,249 in 1884 and 9,026 out of 20,213 in 1885. England sent 2,750 and 2,470 respectively, Germany 2,944 and 2,132, and Sweden 2,015 and 1,642 respectively. Of these 23,320 out of 24,249 in 1884 and 19,461 out of 20,203 in 1885 were females.

The following indicates in what small numbers immigrants affect the question of skilled labor in our foundries and iron works:

Country.	1884.	1885.
Iron fitters.....	75	52
Iron founders.....	19	25
Iron molders.....	154	105
Iron founders.....	39	15
Iron founders, not elsewhere specified.....	7	57
Machinists.....	232	368
Metal rollers.....	8	5
Metal workers.....	45	35
Steel manufacturers.....	14	7
Tool grinders.....	11	19
Tool-makers.....	7	15
Wireworkers.....	—	—

In this list there is certainly nothing to cause any fear of competition among our working population. Taken as a whole the percentage of able bodied men between 15 and 40 years of age in the large number of immigrants is not great, since it was only 38.5 per cent. in 1885 and 44.8 per cent. in 1884.

*Value of a Guarantee.*

The precarious nature of a guarantee, and the danger of creditors trifling with or changing the terms of the main contract if they desire to assert their right to fall back on the collateral promise, are illustrated in several recent decisions of the courts, which should serve as warning and instruction to the business public. These decisions cannot be said to enunciate any new principles, but they are interesting and important if only as positive affirmations of established law. A guarantee—that is, a promise by a disinterested party to pay the debt of another person if he does not or cannot—is generally if not always made for the accommodation or benefit of the person so guaranteed exclusively. The guarantor receives no consideration or value for his promise, but acts merely from friendly feeling without any hope or expectation of personal gain or advantage. He relies on the honor and financial soundness of the one whom he guarantees. It is seldom that a guarantor becomes such expecting that he will ever be called upon to pay the debt. Nevertheless, although the guarantor receives no value or consideration for his promise, it is not a contract without consideration in such a sense as to exempt him from liability to the creditor. He is held to accountability on the ground that, as the creditor advanced the money or gave the credit to the debtor, relying on the guarantee to protect himself, the guarantor cannot in equity be allowed to allege want of consideration and stultify himself by repudiating his promise, especially where this course would result in pecuniary damage. The consideration lies in the fact that the creditor has parted with something of value on the faith of the guarantee, and that he would be injured by its repudiation.

Although overshadowed as a topic of discussion in and out of Congress by the silver question, attacks on the tariff crop up now and then. It is asserted in a number of dispatches from Washington that several of the Northwestern railroads have begun an aggressive movement looking to reduction of the duty on steel rails to \$7 or \$8. Judging from the reports to newspapers which have been prominent in their urgency for tariff changes, this alleged movement has been greatly exaggerated.

*The Report of the Fortification Board.*

The Fortification Appropriation bill passed at the close of the last Congress provided for the appointment by the President of a board, of which the Secretary of War was to be president, to be composed of two officers of the Engineer Corps, two from the Ordnance Corps, two officers of the line of the navy and two civilians. This board was to examine and report at what ports fortifications or other defenses are most urgently required, the character and kind of defense best adapted for each, with reference to armament and the utilization of torpedoes, mines or other defensive appliances. The board was appointed in the latter part of last May, and consisted of William C. Endicott, Secretary of War, president of the board; Brig.-Gen. Stephen V. Benét, Chief of Ordnance; Brig.-Gen. John Newton, Chief of Engineers; Lieut.-Col. Henry L. Abbott, Corps of Engineers; Capt. Charles S. Smith, Ordnance Department; Com. W. T. Sampson, U. S. Navy; Com. Casper F. Goodrich, U. S. Navy; Mr. Joseph Morgan, Jr., of Pennsylvania, and Mr. Erastus Corning, of New York.

A large volume of evidence taken by the board will accompany the report, together with number of appendices, making altogether the most thorough exposition of the needs of the country's coast defense ever presented to Congress. Some of the evidence the board has eliminated from the document to be sent to Congress, for the reason that it necessarily exposed the weakness of our seacoast and would invite attention to ports requiring strong defenses. It is understood

that the board estimates that an appropriation of \$21,000,000 will be necessary the first year to carry into effect its plan of fortifications and providing for their armament. The latter includes the establishment of one or two gun foundries, the recommendations of the Gun Foundry Board being that the plant for the War Department should be at Watervliet Arsenal, New York, and for the Navy at the Washington Navy-Yard. These recommendations were arrived at by the Foundry Board after a most careful examination of the question where plants could be profitably and satisfactorily established. They are referred to as being the places where great guns could be produced to the best advantage. The aggregate of the amount to perfect the plan, it is said, is \$126,000,000, and a period of six years will be required to complete it. The scope of the report is defined in the law creating it. Portland, Portsmouth, Boston, Newport, New York, Philadelphia, Baltimore, Norfolk, Wilmington, Charleston, Savannah, Pensacola, New Orleans, Mobile, Galveston and San Francisco are places where fortifications or additional defenses are urgently required, though at some of the ports of lesser importance, except where the Government has naval stations, the necessity for their immediate construction is not emphasized. Washington is included in the plan of defense arranged for Baltimore and Norfolk. The mouth of the Columbia River is also one of the points to be protected on the Pacific Coast, to prevent ingress and protect Portland, in Oregon.

In considering the utilization of torpedoes, mines and other defensive appliances, as well as the size and power of the guns and the protection of the forts or defenses, the board has adhered strictly to the line of knowledge which practical tests have shown to be the most reliable, and have avoided special claims of every kind in their report. The necessity for impregnable defenses is assumed. The means by which from these positions the approach of the great armored vessels with their far-reaching guns can be successfully disputed is the other object to be attained. Only existing weapons and projectiles are discussed in the report. The board, though appointed to consider the subject of coast defenses, was obliged to also consider the great progress made in naval warfare and the capacity of some of the modern guns to throw missiles many miles. The erection of land defenses, for instance, about New York would not prevent the shelling of Brooklyn from a distance, which it would be difficult, if not impossible, to prevent by land fortifications. This is also true of Boston, Charleston, Galveston and San Francisco. Under the clause, therefore, "at what ports fortifications or other defenses are most urgently required, the character and kind of defense best adapted for each," the board found it necessary to establish, as the first line of coast defense, floating batteries or armored ships capable of offensive and defensive warfare; gunboats for the ports reached by inland waters and torpedo-boats for general use in deep water and shallow rivers. The 13 floating batteries, estimated to cost \$3,000,000 each, would be distributed as follows: New York harbor, four; Boston, Charlestown, Pensacola and Galveston, one each; San Francisco, two; entrances to Delaware River, one, and for the protection of Baltimore, Washington and Norfolk, two, to be stationed at Hampton Roads, or near the mouth of Chesapeake Bay. Besides these the necessities of a cruising navy as auxiliary to the first line of defense are also fully considered. The torpedo-boats required will be about 40, at a cost of \$100,000 each. For the land defenses the front of the fortifications will be of heavy armor plates and of such thickness as to be impenetrable to any distance even at close range. The kind of turrets for the protection of the heavy ordinance to be mounted on shore will be hereafter determined, according to tests to be made to secure invulnerable defenses for the coast guns. The approaches will be so arranged as to deflect shots aimed at them.

The probability of dynamite being utilized as a means of destruction in the event of an attack on our seacoast defenses is not, it is said, recognized by the board. Nor is it regarded as a means of protection against a sea attack, except in connection with torpedoes. In this connection Mr. Michael Jacobs, of New York, who is perfecting the Hayes nitro-glycerine shell, says that if dynamite can be safely and effectively used in a shell thrown in the ordinary way, while it may not change the character of armored ships, it will certainly change the plans of every seacoast defense. The first fact which is to be established by the Ordnance Bureau of the Navy Department is whether such a shell can be as safely fired as an ordinary shell. When this is accomplished the next fact to be ascertained is whether such an explosion will be as destructive to ships and fortifications as is now believed. Commodore Walker, Chief of the Bureau of Navigation at the Navy Department, says that the theory of ordnance experts is that the instantaneous bursting of a dynamite shell which follows concussion would not be as effective as one having the power of penetration and exploded in the present way. That, however, is now only a theory, which Mr. Jacobs says will be satisfactorily tested when he is ready to furnish the Navy Ordnance Bureau with the shells. They are in every respect as a projectile identical with the form of shell as now used. The explosive material does not become nitro-glycerine until the shell is discharged from the gun.

That is all that is claimed, and that the ordnance experts are going to verify as soon as possible. If the three elements of dynamite can be kept apart and only released and commingled by the velocity of the shell, as it is said is provided in the Hayes nitro-glycerine shell, naval officers admit that safety in handling and firing is established.

If as a weapon of destruction it should be found as effective as dynamite is supposed to be, it will not only be an important adjunct in modern warfare, but will also challenge the genius of naval constructors to devise a ship that can resist its fearful power. Accompanying the report is also a statement of all the vessels in the world carrying great

guns, their capacity for offensive and defensive warfare, the number of officers and men required to man them, the distance which each can throw shot and shell, and their ability to resist attack from another vessel.

The defenses for the lake ports include Buffalo, Cleveland, Sandusky, Toledo, Detroit, Chicago, Milwaukee, Duluth and some other ports along the line of the lakes. Under the provisions of the treaty with Great Britain, concluded April 28, 1817, the naval force to be maintained upon the American lakes by the United States Government is limited by a certain number of small vessels. At present a compromise exists by which the United States steamer Michigan, having a tonnage equal to the small vessels allowed, is permitted to patrol the lakes. The board, therefore, was restricted by the treaty in planning a water line of defense, but it is understood the plan agreed upon will be found effective without requiring an abrogation of the treaty provisions. The construction of the land line will be immediately under the control of the army. It is possible that a fleet of torpedo-boats may be constructed, such as could be readily transferred from the sea coast to the lakes via the Erie Canal in case they should be required for immediate service on the lakes. The lake outlet of the canal, therefore, is one of the points especially to be strongly fortified.

**WASHINGTON NEWS.**

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 25, 1886.

SUB-COMMITTEE OF WAYS AND MEANS.

The chairman of the Committee on Ways and Means has announced the following sub-committees to have charge of different subjects entering into the bills referred for consideration and report:

On Public Debt, Funding and Payment Thereof—W. R. Morrison, of Illinois; W. C. P. Breckinridge, of Kentucky; W. D. Kelley, of Pennsylvania.

On Revenue Provisions of Commercial Treaties—R. Q. Mills, of Texas; W. C. Maybury, of Michigan; Frank Hiscock, of New York.

On Amendments of Customs Laws—Abram S. Hewitt, of New York; C. R. Breckinridge, of Arkansas; W. McKinley, Jr., of Ohio.

On Relief Bills and Claims—Benton McMillen, of Tennessee; W. C. Maybury, of Michigan; T. R. Reed, of Maine.

On Amendments of Internal Revenue Laws—H. R. Harris, of Georgia; W. C. P. Breckinridge, of Kentucky; T. M. Browne, of Indiana.

On Importation of Fish, &c.—C. R. Breckinridge, of Arkansas; W. C. Maybury, of Michigan; T. R. Reed, of Maine.

**TARIFF PROSPECTS.**

There is no doubt whatever of the introduction of a tariff reduction bill by the Committee on Ways and Means. Mr. Morrison has informed the correspondent of *The Iron Age* that he is again at work on such a measure, and has commenced his renewed efforts by conferring with the gentlemen who have submitted bills which have been referred to the committee. The measure upon which Mr. Morrison has been at work since last summer, with the aid of certain authorities on pro-British economic policy, will not be materially changed in theory, though in a few details it will be adapted to the views of certain elements of the majority in order to promote harmony when the bill comes into the House for discussion and action. Mr. Morrison indicates that he is willing to recede a little from the amount of reduction claimed in former measures, so as to establish the principle of gradual reduction in the rates of duty, and in a subsequent measure in the next Congress to go a step further. The effect of these incessant agitations on the industries of the country does not appear to enter into the calculations of Mr. Morrison and his friends. The view expressed by Mr. Morrison is to report to the House what might be regarded as a moderate measure, with a view to the invitation of a general discussion of the tariff question upon which the friends of tariff reduction can enter into the Congressional campaign a few months hence. The results of that campaign will then decide the question as to how much further the pro-British economic theory shall govern in future legislation on the tariff.

**SENATOR MORRILL'S VIEWS.**

Senator Morrill, chairman of the Committee on Finance, says: "Speaking for myself, I do not think that it would be expected just now to pass the resolution against a reopening of the tariff question. As a member of the Finance Committee, I think it would be better to await the action of the House, and by that means ascertain precisely what position they will take. I do not think it good tactics to announce in advance what the Senate will do. I have no idea that the House will send us a bill which the Senate will be likely to pass, but it may be just as well to accept an opportunity to take action upon a measure, so as to get the issue squarely before the people. There is a great deal of deception practiced under the guise of protecting American labor, and that might as well be understood and ventilated now as later. If, as the President says in his message, the protection of American labor is the most justifiable pretext for a policy of protection, then it might be well to show whether a protective tariff or revenue tariff meets that requirement. I am opposed to agitation, but under the circumstances it may be as well to have the question placed before the people."

**THE ADMINISTRATION TRYING TO PROMOTE HARMONY.**

There have been several conferences between the supporters of Mr. Randall's views and Mr. Morrison, which indicates that some agreement will be reached on the amount of reduction to be assigned to each of the schedules. This action, it is understood, has been taken at the suggestion of the Administration, and is the secret of the disposition of both Mr. Morrison and Mr. Randall to recede from the extreme positions which

they held in the last controversy on the same subject. There is also some apprehension that such a moderate measure may be presented as will exert an influence over some of the less enthusiastic protection Republicans.

**THE SILVER QUESTION TO ENTER INTO THE CONTEST.**

The silver managers are also trying to turn their interests to account by negotiating an alliance offensive and defensive with either side of the tariff controversy which will support their views in favor of silver. Mr. Morrison is now in frequent conference with the department and others formulating a tariff bill which will meet all the views of his party and that will be put forth substantially as an Administration measure.

**LATEST CUSTOMS DECISIONS.**

Steel rods, 3 feet in length, larger than No. 5 wire gauge, were decided by the court, in the case of Frasse vs. Robertson, to be dutiable, inasmuch as they cost over 10 cents per pound, at the rate of 3½ cents per pound, under the provision in Schedule C., T. I., new, 177, for steel in bars. This decision of the court, which, by the advice of the United States Attorney-General, has been acquiesced in by the department, reverses the ruling of January 26 (Synopsis 6142). The latter decision is therefore revoked.

The additional duty prescribed by Section 2900 of the Revised Statutes is not a penalty within the purview of any of the penal sections of the statute, and the Secretary of the Treasury has no authority to relieve importers from the payment of such additional duties when they legally accrue and have been assessed by the collector of customs.

No refund of duties can be made on imported merchandise which, on importation, was entered for consumption, and after due delivery to the importers was destroyed by fire, the merchandise not being at the time of the fire within the custody or control of the Government.

**The Outlook for Tin.**

So far the expectations entertained in December have not been fulfilled, and business in merchandise generally, and in tin in particular, has opened decidedly flat, for what precise reasons it is difficult to determine. It is evident that politically the situation in Europe is anything but reassuring. England, usually so calm internally, is deeply agitated, and opinion on leading topics hopelessly divided; and on the Continent the leading powers, apparently still in a conciliatory mood, are secretly preparing for an emergency which may arise from a wrong solution of it in Congress because uneasiness in financial and commercial circles. The hesitation, therefore, on the part of business men on both sides of the Atlantic at a moment when in other respects the dawn of a more prosperous period seemed at hand is thus in a measure accounted for.

Tin having been one of the few leading articles which in Europe and America increased in value last year, is now looked upon with all the greater suspicion, since it opened the year with the full advance that had been reached in 1885, when the course of Straits in London was as under:

Price.	Visible supply,
£ s. d.	tons.
January 1.....	14 10 0
February 1.....	15 0 0
March 1.....	15 0 0
April 1.....	15 0 0
May 1.....	15 0 0
June 1.....	15 0 0
July 1.....	15 0 0
August 1.....	15 0 0
September 1.....	15 0 0
October 1.....	15 0 0
November 1.....	15 0 0
December 1.....	15 0 0

The following figures show the supply and demand of foreign tin for Europe and America:

**ROOT'S HANDY CLOTH BOUND  
HARDWARE PRICE CARDS,  
FOR EITHER WHOLESALE OR RETAIL TRADE.**

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(CARD No. 11-A.)

THESE CARDS COVER the lines having a large variety of sizes or numbers, avoid marking each package or article, in Retail Stores, and are very convenient for use in Wholesale Sample Rooms. They secure correct and uniform selling prices, pay for themselves several times a year by saving time, and are intended for at least ten years' constant use. Hence, no Hardware Dealer can afford to do without them, or spend the time required to write and rule out something similar by hand. They are printed in very distinct type, on the best *Byron Weston's Ledger Paper*, appropriately ruled with blue ink cross-lines and red ink down rulings,

## DESCRIPTIONS AND PRICES.

Card	No.	Size and Price Per Card.	Length In.	List.	Cost.	Job.	Sell.
1	A—BAR IRON, Weight of Round, Square and Flat, per Foot, and Tire per set. Western Classification and Prices of Extras on American, Norway and Swedes.	5 1/2 x 18 in.	16				
	B—BAR STEEL, all Kinds and Sizes with Prices of Extras. Horse and Mule Shoe Size, Weight, No., in Keg. Toe Caiks. Cut Nails, List of Extras.	40c.	18				
2	A—CUT TACKS, Exact size cuts. Length. Number in a pound.	3 x 13 1/2 in.	20				
	B—LARGE HEAD CARPET TACKS. Gimp and Lace Tacks. Hungarian Nails, Hob Nails, Blued and Tinned, American and Swedes. Exact size cuts shown of all the above.	30c.	22				
3	A—SHOW NAILS. Cigar Box Nails. Copper Tacks, Double-Pointed Tacks and Cuts. Glaziers' Points and Cuts. Barbed Blind Staples.	3 x 13 1/2 in.	26				
	B—PATENT BRAIDS. Finishing Nails. Blued Clout Nails. Tinned Clout Nails.	30c.	28				
4	A—IRON WOOD SCREWS.	6 x 16 in.	30				
	B—IRON WOOD SCREWS (continued). Iron Machine Screws.	40c.					
5	A—STANDARD CARRIAGE BOLTS.	3 x 13 1/2 in.					
	B—STANDARD CARRIAGE BOLTS (continued). Plow Bolts.	30c.					
6	A—MACHINE BOLTS.	3 x 13 1/2 in.					
	B—STANDARD TIRE BOLTS. Round and Flat Head Stove Bolts.	30c.					
7	A—PHILADELPHIA CARRIAGE BOLTS.	3 x 13 1/2 in.					
	B—PHILADELPHIA CARRIAGE AND TIRE BOLTS.	30c.					
8	A—SQUARE AND HEXAGON NUTS. Wrought Washers. Size of Bolt, size of Hole, Width, Thickness, number in 100 pounds.	3 x 13 1/2 in.					
	B—COACH OR LAG SCREWS. Superior and Norway Axle Clips.	30c.					
9	A—BRIGHT SCREW HOOKS. Belt Hooks. Blake's Belt Studs.	3 x 13 1/2 in.					
	B—BRIGHT SCREW EYES. Gate Hooks and Eyes. Cornice Hooks and Eyes.	30c.					
10	A—PLATE CASTERS AND BED CASTERS.	3 x 13 1/2 in.					
	B—WROUGHT HOOKS AND STAPLES. Trap Door Rings. Hasps and Staples, and Staples only.	30c.					
11	A—Saws, Hand, Panel and Rip. Combination and Back. Dissertor's and W. M. & C.'s corresponding numbers and "Our Brand."	3 x 13 1/2 in.					
	B—Saws, Back, Compass, Pruning, Kitchen, Butcher's Bow and Blades, Framed Wood Saws and Blades.	30c.					
12	A—CHISELS. Slicks, Socket Framing, Socket and Tanged Firmer, Corner.	3 x 13 1/2 in.					
	B—Turning Chisels and Gouges, Socket and Tanged Firmer Gouges.	30c.					
13	A—Cast Steel Augers and Bits. Boring Machine Augers. Jennings' Auger Bits.	3 x 13 1/2 in.					
	B—Bit Stock Drills. Gimlet Bits, German Pattern, Double Cut and Countersink. Center Bits. Clark's Expansive Bits.	30c.					
14	A—HAMMERS. Adz Eye, Bell Face, Joiners', Steel Face and Claw, Riveting, Farriers', Blacksmiths', Machinists', Engineers'.	3 x 13 1/2 in.					
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Length In.	List.	Cost.	Job.	Sell.			
16							
18							
20							
22							
26							
28							
DISSTON'S NO. 7. PANEL, HAND & RIP. W.M. & C. NO. 25.							
Length In.	List.	Cost.	Job.	Sell.			
16							
18							
20							
22							
26							
28							
30							
DISSTON'S NO. 8. HAND AND RIP. W.M. & C. NO. 26.							
Length In.	List.	Cost.	Job.	Sell.			
26							
28							
DISSTON'S NO. 9. HAND AND RIP. W.M. & C. NO. 27.							
Length In.	List.	Cost.	Job.	Sell.			
26							
28							
30							
DISSTON'S NO. 12. HAND AND RIP.							
Length In.	List.	Cost.	Job.	Sell.			
26							
28							
OUR BRAND.							
PANEL, HAND AND RIP.							
Length In.	List.	Cost.	Job.	Sell.			
16							
18							
20							
22							
26							
28							
SPECIAL C. S. PANEL AND HAND.							
Length In.	List.	Cost.	Job.	Sell.			
16							
18							
20							
26							
COMBINATION HAND.							
Length In.	List.	Cost.	Job.	Sell.			
26							
DISSTON'S NO. 1. BACK. W.M. & C. NO. 5.							
Length In.	List.	Cost.	Job.	Sell.			
10							
12							
14							
15							
16							

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This extended and comprehensive treatise is an outgrowth, as stated by the author in his introductory chapter, of a request, from the British Iron Trade Association, to prepare a report on the present condition of the manufacture of iron and steel as illustrated by the objects displayed at the French International Exhibition of 1878, in Paris. This work contains not only the general results then arrived at, but also more extended investigations and experiments which it was considered necessary to pursue to thoroughly discuss the subjects under treatment. The appended headings of the 18 sections into which the volume is divided will give an idea of its scope:

Section I. Introductory. Section II. Historical. Section III. Direct Processes Preliminary Treatment of Materials for the Making Malleable Iron. Section IV. for Blast Furnace. Section V. the Blast Furnace. Section VI. On the Use and Theory of the Hot Blast. Section VII. On the Quantity and Quality of the Fuel Required in the Blast Furnace Using Air of Different Temperatures. Section VIII. On the Solid Products of the Blast Furnace. Section IX. Chemical Changes as They Take Place in the Blast Furnace. Section X. On the Equivalents of Heat Evolved by the Fuel in the Blast Furnace. Section XI. On Hydrogen and Certain Hydrogen Compounds in the Blast Furnace. Section XII. On the Production of Malleable Iron from Pig Iron in Low Hearths. Section XIII. On the Refining and Puddling Furnace. Section XIV. On More Recent Methods of Separating the Substances Taken Up by Iron During Its Passage Through the Blast Furnaces. Section XV. Statistical. Section XVI. British Labor Compared with That of the Continent of Europe. Section XVII. On Labor in the United States of America. Section XVIII. Chief Iron-Producing Countries Compared.

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EMPIRE KNIFE CO.,

West Winsted, Conn.

**NOTICE.**

The Rock City Saddlery Co., Nashville, Tenn., opens up on January 1st, 1886. All manufacturers interested in such character of goods will please send catalogue, with best cash discount.

**IMPORTANT!!**

Any person of experience and who can furnish the required amount of capital necessary to take part in a manufacturing business already well established can get valuable information by addressing

GEORGE HAW,

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Large Buyers of Shafting are requested to send specification for special prices.

MERWIN McKAIG,

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WANTED—By a graduate of the Massachusetts Institute of Technology, a position as Chemist or Assayer. A position in the iron business preferred. Address

BOX 105,

Melrose, Mass.

**Trade Report.****British Iron and Metal Markets.**

[Special Cable Dispatch to *The Iron Age*.]

LONDON, WEDNESDAY, January 27, 1886.

**Scotch Pig.**—The market is unchanged. We quote makers' brands as follows:

Coltness, alongside, Glasgow.....	48/-
Langlois, " " " "	46/-
Portsmouth, " " " "	45/-
Summerside, " " " "	45/-
Carmiroe, " " " "	44/-
Glenegarnock, " Ardrossan " "	44/-
Elzington, " " " "	40/-
Dalmellington, " Leith " "	48/-
Shotts, " " " "	46/-
Lighterage from Ardrossan to Glasgow is 1/-	1/-

Cleveland Pig.—The market is unchanged. We continue quotations, f.o.b. shipping ports:

Middleboro' No. 1 Foundry.....	37/-
No. 2 " " " "	39/-
No. 3 " " " "	31 @ 3/-
No. 4 Forge.....	30/-

Bessemer Pig.—The market is unchanged. W. C. Hemmets are quoted 45/- for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron.—The market is a little weaker. We quote at works :

Staff. Ord. Marked Bars....	£ s. d.	£ s. d.
" Medium " .....	7 10 0 @	7 10 0
" Common " .....	6 0 0 @ 6	6 10 0
" Common Best.....	6 15 0 @	6 15 0

# Trade Report.

## New York Iron Market.

**American Pig.**—The leading topic of conversation among Pig-Iron producers is the statement of output and stocks issued by the American Iron and Steel Association, which we publish and comment upon elsewhere. It proves that there has been a very much greater consumption in the second half of the year 1885, as compared with the first six months. While it will be conceded that the latter half of the year always shows a livelier consumption, it will be observed that the increase noted, of 600,000 tons, is greater by far than any differences due to season can account for. The stocks are exceedingly low, when we consider Anthracite and Bituminous Pig alone and leave out of consideration Charcoal Iron. It is true, on the other hand, that we generally accumulate Iron during the first three or four months of the year, and are probably doing so now, but this is often swept away with the opening of navigation. All this is very encouraging, but it must not be forgotten that since October 1 there has been a very heavy increase in the production, as our monthly statements clearly show. These prove that if we produce throughout the year at the rate at which we entered it 1886 would exhibit a growth of 25% in the output of the Anthracite and Bituminous furnaces combined in the country over that of 1885. These are indications which must not be ignored, and, while the Pig Iron market has a strong undercurrent of confidence, the prospective supply seems ample for all needs so long as any excitement is avoided. During the week the market has been quiet and steady, though it must be noted that some of the furnaces which have recently blown in are actively looking for purchasers. Quotations are unchanged. We quote for Standard brands, tidewater delivery, \$18 @ \$18.50 for No. 1 X Foundry, \$17 @ \$17.50 for No. 2 X Foundry, and \$16 @ \$16.50 for Gray Forge. Outside brands are 50¢ below these quotations.

**Scotch Pig.**—The market is dull and unchanged. We quote nominally as follows for small lots: Coltness, \$20.50 @ \$21 to arrive; Gartsherrine, \$20 @ \$20.50 to arrive; Shotts, \$20.50 @ \$21 to arrive; Carnbroe and Glengarnock, \$19.50 to arrive; Summerlee, \$20 @ \$20.50 to arrive; Dalmellington, \$19 @ \$19.50 to arrive; Eglinton, \$18 @ \$18.50 to arrive, and Clyde, \$18.50 @ \$19 to arrive.

**Bessemer Pig.**—The market is weaker. We hear of a sale of 5000 tons Solway Hematite at \$19.25 at Hoboken, and of 5000 tons of American at private terms. We quote \$19 @ \$19.50 for Bessemer grades.

**Spiegelsen.**—The market is quiet. One lot of 3000 tons was sold early in the week at private terms. We quote \$27.50 @ \$28 for English 20%, and nominally \$27 for German 20%.

**Bar Iron.**—The market is firmer, particularly for Common. We quote for delivery here in round lots: Common Iron, 1.60¢ @ 1.65¢; Medium, 1.65¢ @ 1.75¢, and Refined Iron, 1.80¢ @ 1.90¢, with half extras. Store prices are 1.75¢ @ 1.80¢ for Common, 1.80¢ @ 1.90¢ for Medium, and 1.90¢ @ 2.0¢ for Refined.

**Structural Iron.**—Inquiries are fair for the season, and there is considerable work in sight. We quote Angles 1.95¢ @ 2¢, delivered, and Tees at 2.25¢ @ 2.35¢ for round lots. Steel Angles are quoted 2.35¢ @ 2.45¢, according to quality. Store quotations remain 2.2¢ @ 2.4¢ for Angles, and 2.5¢ @ 2.7¢ for Tees. American Beams and Channels are 3¢ base from dock for all orders.

**Plates.**—It is reported that there is a large order for 7000 tons on the market. We quote for round lots: Common or Tank, 2¢ @ 2.1¢; Refined, 2.4¢ @ 2.5¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.4¢ @ 3.5¢; Extra Flange, 4¢ @ 4.5¢. For small lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock; Tank, 2.4¢ on dock; Boiler, 3.4¢ for Shell, 3.4¢ @ 4¢ for Flange, and 4¢ @ 5¢ for Extra Flange and Fire-Box.

**Merchant Steel.**—Quotations for the range from ordinary to good grades are as follows: American Tool Steels, 7.5¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; English Tool, 13.5¢ @ 15.5¢; common grades, 7¢ @ 9¢; Crucible Machinery, 4.5¢ @ 6¢; Spring, 2.6¢; Tire, 2.2¢ @ 2.3¢; Open-Hearth and Bessemer Machinery, 2.5¢.

**Steel Rails.**—There is a feeling of uneasiness, and the market is not as strong as it has been. No large lots have been placed during the last week, so that quotations are entirely nominal. It is reported that there will be a meeting of the Rail manufacturers at Philadelphia on the 3d of February. There are several large inquiries on the market, one of them for 20,000 tons for a road in the Southwest.

**Steel Wire Rods.**—A number of round lots have been sold. We quote \$4.20 @ \$4.50.

**Old Rails.**—There have been no sales of American Old Rails of any consequence in this market, which may be quoted nominally \$22 @ \$22.50. English Tees are freely offered for sail shipment at \$22, with no sales reported at that figure. Double Heads are offered at \$22.50.

**Old Wheels.**—The market is dull and quiet at \$15.50 @ \$16.

**Crop Ends.**—Crop Ends are scarce at \$22 @ \$22.50.

**Scrap.**—Scrap is generally held at \$22.40 for No. 1 Wrought from yard, with bids near that figure. We hear of no business.

**Rail Fastenings.**—These are weaker, and some cutting is reported. We quote 2.20¢ @ 2.25¢ for Spikes, 2.75¢ for Bolts and Square Nuts, 2.9¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.7¢ @ 1.75¢ for Splice Bars.

Messrs. Naylor & Co., of 99 and 101 John street, this city, announce to the trade that they are no longer selling agents of the Nor-West Steel and Iron Co., of Boston, to whom they ask that inquiries and orders be directly sent.

### Metal Exchange.

The following transactions are reported as having been made on the floor of the Metal Exchange:

SATURDAY, January 25, 1886.	
5 tons Tin, January.....	20.40¢
5 tons Tin, April.....	20.40¢

### Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., Philadelphia, January 26, 1886.

The week past has been one of remarkable dullness, but, considering the season and the somewhat extraordinary weather, little else but dullness could hardly be expected. Nevertheless, there are no signs of weakness, and buyers find it a difficult matter to place orders at figures quoted a week or 10 days ago. The position is somewhat deceptive in this respect. Business has been (or has appeared to be) so dull that buyers got the impression that even if concessions were not granted they could at least easily duplicate their last orders, but they find themselves mistaken. There may be, and doubtless are, exceptions to this rule, but it may be safely asserted that not a single article on the list is lower than it was a week ago, while in the majority of cases there has been a gradual stiffening in prices and in some a slight advance.

**Pig Iron.**—Shows up remarkably well, and is firmer to-day than at any time since the upward movement commenced. The statistical position is excellent. According to the figures issued by the Iron and Steel Association, stocks decreased during 1885 to the extent of about 180,000 tons. During the last half of the year the decrease was still more striking, being nearly 280,000 tons, notwithstanding a steady and important increase in production during that period. If these figures are correct, and there is no reason to suppose otherwise, the increase in consumption is greater than even the most sanguine persons dared to predict.

**Sheet Iron.**—The market is in all respects unchanged, demand fair and prices firm. The increasing cost of production renders higher figures almost a necessity, and orders are entered very sparingly at about the following quotations for small lots:

Best Refined, Nos. 26, 27 and 28.....	4¢
Best Refined, Nos. 18 to 25.....	3.5¢
Common, 3¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 25.....	5¢
Best Bloom Sheets, Nos. 16 to 21.....	4.5¢
Blue Annealed.....	3¢
Best Bloom, Galvanized, discount.....	5.5¢
Common discount.....	6.5¢

**Structural Iron.**—There is a fair inquiry from the bridge-builders, also from the shipyards, a considerable amount of business having been placed within the past ten days. Manufacturers of Iron are well supplied with orders, and prices are firmly held at about last week's quotations, viz.: 2¢ @ 2.05¢ for Angles; 2.1¢ @ 2.2¢ for Bridge Plate; 2.4¢ @ 2.5¢ for Tees, and 3¢ for Beams and Channels.

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Best Refined, Nos. 26, 27 and 28.....	4¢
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sent to the lowest selling price. The opinion prevails that an advance will be made within the next week or ten days.

**Ore.**—While it is true that a considerable quantity of Ore has been contracted for, it is said by prominent miners that the contracts have been accepted on conditional prices, which leaves buyers still in the dark as to what they will have to pay. Prices named are held as ranging from \$5.50 to \$6.50 on dock at Cleveland, but these figures are strongly opposed by some of the heavier consumers. It is estimated that about 3,000,000 tons of Ore will be mined during the season, and the fact that pretty much all the surplus that has been carried for several years has been absorbed places the price almost entirely on the basis of cost of mining, shipping and profits expected, which as yet have not been decided upon.

**American Pig Iron.**—Comparing the week just closed with the previous one, the market shows some falling off in demand and more apathy on the part of buyers.

This lull, however, has not affected the firmness of the market, and prices remain firm, with slight advances named on special brands for immediate delivery. Lake Superior Charcoal Irons are selling at \$23 for standard brands, while some furnaces who claim extra quality for their Iron are asking 50¢ per ton more.

**Galvanized Iron.**—Makers are having a slightly increased trade, but there appears to be no change in the market price. On some of the very best brands dealers say they have difficulty in getting even small lots, and manufacturers do not care to accept orders for future delivery. Some very low prices are still named, but the general quotations from store are 60¢ off on Juniata and 60¢ and 10¢ off on Charcoal.

**Old Wheels.**—The demand for Old Wheels has declined within the last week, and prices are said to be a shade below figures named as bottom last week. Stocks are in such shape at the present time that there is no regularity in price, and while some holders are asking \$18.50 @ \$19 we learn of others who are asking \$20 and claim to have made sales at that figure. Contrary to this it is said that Wheels have been offered at \$17.50, so that it is possible that purchases could be made at figures ranging from this figure to \$18.

**Scrap Iron.**—There has been a fair demand for Scrap and a scarcity reported in extra qualities. On No. 1 Wrought \$19.25 has been named, with sales reported at \$19.50. No. 1 Mill is quoted by sellers at \$15, and No. 2 at \$10. The North Chicago Rolling Mill Co. are offering about \$1 per ton less at Milwaukee. Stocks are becoming quite scarce, and not much of any grade offering. Dealers continue to quote purchasing prices at figures last named.

**Pig Lead.**—The market was less firm and trading confined to small lots for near shipment. Sales of several hundred tons spot Lead are reported at \$4.40, but it is said that sales have been made at \$4.35. Consumers are not inclined to buy extensively for futures, though dealers are wont to impress them with the limited supply in transit from refiners. All things considered, there is nothing visible that indicates much of a change in price during February.

**Best Refined stock.**—On other grades it is confessed that the figures are shaded 5¢, and rumor has it that Iron has been sold at 10¢ less quite recently. Mills claim that they will not sell Iron at less than 1.75¢ base sizes, but would be willing to make a lower price on specifications embodying large quantities of extras. Leading manufacturers have been predicting an advance during the entire month, but thus far the elements which have prevented it control their actions, and prices remain unchanged.

**Old Rails.**—There is little or no change to note in this market. Buyers have advanced their offering price to \$22.50 @ \$23, but are unable to secure quantities of any size at these figures. Movable stock is pretty well exhausted, and the conditions of the weather make impossible the handling of Rails otherwise available. Holders are asking from \$24 to \$25 per ton, and cannot furnish very large lots at this figure. The North Chicago Rolling Mill Co. quote \$22 at Milwaukee.

**Track Supplies.**—The demand from railroads is improving. Inquiries are becoming more numerous, and prices named are said to be firm. Spikes, 2½¢; Splice Bars, 1.80¢; Bolts with Hexagon Nuts, 2.95¢; do. Square Nuts, 2½¢.

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### Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts.,  
CHATTANOOGA, January 25, 1886.

Business, like the weather, has relaxed to a considerable extent from its previous congealed condition and resumed in some measure its accustomed activity. Cotton is still very much behind and low in price, which causes collections to be slow in the cotton districts. With this exception the middle belt of the South, where the manufacturing interests are mostly located, shows an activity which appears to grow in interest. Every week some new enterprise is set on foot. There is no doubt the present year will add a large number of new manufacturing concerns to this section. Several new Iron furnaces are talked of, with a probability of some of them taking shape during the present year. The question of the basic process is receiving considerable attention, but nothing has taken definite shape as yet.

**Pig Iron.**—It would be a difficult task to make a correct diagnosis of this market at the present time. It is true that the spirited demand of some two or three weeks ago has fallen off, and speculative inquiries at present are very few, but the furnaces are not at all uneasy over the situation. Should not another order come in for the next two months there is scarcely a furnace in the district that would experience any inconvenience. Some of them are sold much ahead of this period, and many have certain customers who continue to take their output at fair ruling rates. The demand from the Southern furnaces has been very active during the past week, and orders have been entered from that source alone with the furnaces in this immediate district aggregating about 1,900 tons, which would show that they, at least, anticipate a good business early in the season. A matter of considerable interest to the producers of the United States is the fact that should the prices of Pig Iron go higher, or any considerable concession be made on the tariff, most of the furnaces on the Southern seaboard will get their supplies from over the water. A large concern is now negotiating for 150 tons of Scotch Pig per month for the next nine months. They say that at the low price of freight in cotton bottoms the cost will be but a trifling over

what they now pay for American-made Pig. Freight on Pig have been raised about 50¢ per ton to all Northern and Western points, but no change has been made to points East and South. Shipments to Eastern points during the month of December were 4673 tons, against about the same amount the month previous, and so far this month have averaged about the same.

**Hardware.**—This business is again quite active, and the wholesale dealers are doing fairly well in general lines, and more in goods appertaining to House Trimmings. For Bar Iron the demand is very active, and the same may be said of Nails.

**Railroad Material.**—For the past few days the demand has been very active, especially for Light Rails ranging up to 30 lb weight.

The anticipated change of gauge

of nearly all the railroads has caused a large demand for Spikes which the mills have hardly been able to supply.

**Cast Pipe.**—The works here have now about 3,400 tons booked ahead for future delivery, and have refused to entertain offers for as much more. They are now erecting an addition to their works, 75 x 100 feet, and also a pattern and machine shop 50 x 80, three stories high, and will when completed have a capacity of about 140 tons per day. Heretofore they have been extending their trade far into the North and West, but within the last year no less than 28 Southern towns have inaugurated a system of water-works. The products of the works has mainly been taken by these Southern towns, and from indications many more of the smaller towns are likely to introduce a general system of water-works, which will still add largely to the demand for Pipe.

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# Trade Report.

## General Hardware.

The volume of business is fair, and in many lines manufacturers report a much more satisfactory condition of things, and a better outlook than for several years. The changes in price during the past week have not been many, but are generally in the direction of advances. The special features of the market are noted below.

### BARB WIRE.

The market is very quiet, but firm, at the recent advance. We quote 4.75 cents for carload lots of Four-Point Barb Wire, Galvanized, 4% cents for 3-ton lots and 5 cents for 1-ton lots. These quotations cover only such Wire as will be shipped by March 1.

### NAILS.

There has been a flurry in Nails during the week, and considerable business has been done at low prices, with the result that those who have been free sellers for some time past have been filled up for the present. They are asking higher prices now, and the market is stiffer. A good many of the leading mills have stood by quietly and have not swerved from their policy of piling up rather than selling. We quote Iron Nails from store, \$2.35 @ \$2.45, and carload lots, \$2.25.

### LOCKS.

The Lock market is more regular than it has been for a long time, and the new prices are much more closely adhered to than heretofore. Extras are given with much less liberality, and a disposition is evinced, even by the manufacturers who are known as having of late made the lowest prices, to maintain with fair firmness the new quotations. So that altogether the market is in much better shape, and the wisdom of the association in putting prices on what is intended to be a solid basis, so that the regular quotations may have some significance, is generally admitted. Although in doing this a material reduction in nominal prices was made, which had temporarily a slightly depressing effect on the market, it is generally conceded that its effect has been, on the whole, decidedly beneficial, as it is more injurious to the tone of the market to have prices irregular than to have them low.

Advices from some of the manufacturers outside of the combination indicate that they also regard with satisfaction the recent change of prices, and uniformly express the opinion that it will not result in diminishing the amount of production of the non-associated manufacturers. One prominent manufacturer refers to the action as having a tendency probably to make them push their business the more vigorously, and another alludes to it as satisfactory, as it will probably prevent a good deal of the cutting in prices which was carried on before the change, while a third house intimates that there will be no difficulty in meeting the new prices. Some of the manufacturers will probably issue revised lists and others are not intending to do so at present. Alluding to the effect of the new prices, one of our correspondents says:

In our opinion the recent changes will prove beneficial to the manufacturers, preventing cutting of prices. Hitherto the difference in price between the cheap and the medium and better grades of Locks was too great, resulting in the sale of comparatively few good Locks. We feel confident it will be the means of the manufacturers receiving orders for first-class Locks, on which there is still a small margin left, and on the whole we are perfectly satisfied with the new deal.

Concerning the general situation another house, referring to the probable policy of the outside makers, remarks:

We have made no change in our lists and discounts, and do not intend to unless compelled. Our inventory stock on hand just made is the lightest in three years, and we see no valid reason why ruling prices for 1885 should not be maintained. In fact, we had anticipated a substantial advance in some goods. We do not think the action of the association will diminish the production of outside makers. They will all stay in the market so long as they have a profit, and no longer, and whenever there is a margin will go in again. That is the way we feel. If there is an excess of goods the manufacturers have it. We never knew the retail trade as bare as now, and the same can be said of many leading jobbers, and they will not be tempted by lower prices to buy more than they want.

### MISCELLANEOUS PRICES.

The Hartman Steel Co., Beaver Falls, Pa., issue a circular illustrating Wire Nails from 2d. fine to 6d., with the number to the pound, as well as of the same sizes of Steel Cut Nails. Their base price is announced as 4% cents per pound for 1d. to 6d., advances for the smaller sizes being made, in accordance with the card adopted by the manufacturers and recently given in these columns.

A very excellent movement is on foot among the leading jobbers of the West, looking to a maintenance by them of any advances which may be made by the manufacturers. Its object is by concerted action to enable them to reap the benefit of such advances in the sale of goods bought at the old prices, while at the same time a better tone will be given the market and greater regularity given to prices. This is certainly on all accounts a most desirable effort. Jobbers are, in the nature of the case, compelled to bear losses through the decline of stock on hand, and this has been a serious drawback during the long season of shrink-

ing prices, and it is only right that by agreement among themselves and the co-operation of the manufacturers they should have the benefit of such advances as may occur. If this effort results, as we hope it may, in inducing such houses generally to sell their stocks at the advanced prices, it will be a gain not only to them, but to the whole trade.

The manufacturers of Steel Goods are adhering firmly to the advanced prices and naming discount 60 and 10 and 5 to the general trade. Many of them are full of orders and unable to deliver goods in the near future. Some of the jobbers show a disposition to sell the goods at about former prices, instead of taking advantage of the advance made by the manufacturers. There is, however, a firm feeling in the market for this line of goods, and it is hoped that the jobbers generally will follow the advance which has been made by the manufacturers.

The Wire market is very firm at the advanced prices alluded to last week, in making which the leading manufacturers have united. The probability of a further advance is also alluded to by some.

Cast Butts are held generally at the advanced prices, but some jobbing houses are still selling them, presumably from old stock, at about former prices.

At the late meeting of the American Block Makers' Association in this city, George S. Adams, 389 Howard street, Detroit, Mich., was chosen president. It was decided to continue the association, whose working is referred to as having been satisfactory and conducive to the interests of manufacturers and the trade generally. The former scale of prices was continued, with a slight change by which a small advance was made in the extreme price, the quotation to the retail trade remaining as before. The anticipation is expressed by the members of the association that the organization is on a solid footing and that prices will be steady the coming year.

The Unadilla Machine Works, Unadilla, N. Y., quote Teller's Kitchen Knife at \$1.25 per dozen, subject to a discount to the retail trade of 10 per cent.

E. S. HULBERT & CO., Bernardston, Mass., issue the following list of Butcher Knives, &c. This season they have added to their line:

5½-inch and 6½-inch Butcher Knives.  
5½-inch and 6½-inch Sticking Knives.  
14 and 18 inch Hotel Slicers.  
10 and 12 inch Cheese Knives with sharp points.

They are also making 6, 6½ and 7 inch Butcher Knives with cocoa handle, designed for the house-furnishing trade, which are described as made from the same quality of double shear steel as their Beech-Handle Knives, and fully warranted. They also advise us that they are making an extra quality Paring Knife. Their list is as follows, subject to a discount of 40 and 10 per cent., with an additional discount of 2 per cent. for cash.

### Butcher Knives.

	Per doz.
5-inch	\$3.00
5½-inch	3.50
6-inch	3.80
6½-inch	4.50
7-inch	5.20
8-inch	6.60
9-inch	7.80

### Steak Knives.

	Per doz.
10-inch	\$9.00
11-inch	12.00
12-inch	15.00
13-inch	16.50
14-inch	18.00

### Pork Knives.

	Per doz.
10-inch	\$9.00
11-inch	12.00
12-inch	15.00
13-inch	16.50
14-inch	18.00

### Sticking Knives.

	Per doz.
5-inch	\$3.00
5½-inch	3.64
6-inch	4.20
6½-inch	4.90
7-inch	5.60

### Skinning Knives.

	Per doz.
5-inch	\$3.08
5½-inch	3.64
6-inch	4.20
6½-inch	4.90
7-inch	5.60

### Miscellaneous Knives.

	Per doz.
12-inch Splitting Knives, Heavy Back	\$18.00
12-inch Cooks' Leaning Knives	15.00
Boning Knives	4.20
Jeweler's Diamond Knives	3.50
Very Fish Knives, Assorted	3.00
Paring Knives	1.75
6-inch Butcher Knives, Cocoa Handle	5.00
7-inch Butcher Knives, Cocoa Handle	7.00
14-inch Hotel Slicers, Cocoa Handle	18.00
18-inch Hotel Slicers, Cocoa Handle	24.00
Carving Knives, Royal Slicers, Cocos Handle	7.00
Bread Knives, Cocoa Handle	5.00
Carving Knives and Forks	1.50
Cheese Knives, Plated	Per doz.
10-inch, Square Point Cocoa Handle	\$9.00
12-inch, Square Point, Cocoa Handle	12.00
10-inch, Sharp Point, Cocoa Handle	9.00
12-inch, Sharp Point, Cocoa Handle	12.00

### Butter and Lard Spades, Plated.

	Per doz.
3 x 6 inch	\$7.20
3 x 8 inch	8.50

### ITEMS.

John H. Graham & Co., 113 Chambers street, New York, have recently been appointed agents for the following manufacturers, whose goods they will carry in stock and on which they are authorized to make the manufacturers' best terms: Barton Bell Co., East Hampton, Conn., manufacturers of Hand, House, Call, Sleigh Bells, &c., and Gay & Parsons, Augusta, Me., manufacturers of the Interchangeable Screw-Driver Set, Double Action Ratchet Screw-Drivers, &c.

Weaver, Goss & Co., Rochester, N. Y., issue a circular announcing that owing to the increase of their trade they are compelled to seek more commodious quarters, and shall remove about February 1 to Nos. 49 and 51 North St. Faubstreet, where they will be president, and W. R. Patton, secretary.

George P. Clark, Windsor Locks, Conn., manufacturer of Hardware Specialties, Ma-

tinbury, &c., advises us that he is adding new styles to the different lines of Truck Wheels, Trucks, Exhaust and Ventilating Fans made by him. He is about to put on the market another style of Exhaust Fan, which is described as suitable for placing in a window or other aperture in the side of a building for drying or ventilating purposes.

He is also making another style of Truck Wheel for mill and warehouse use, which with other goods will be described in his catalogue soon to be issued.

The Southern White Lead Co., of St. Louis, under date of January 14, announce to the trade that for the convenience of their customers in and around Chicago they have established a supply depot at No. 90 Franklin street, in that city, where they will keep a full stock of Southern Company White Lead, and also their Red Lead. Invoices will be sent from St. Louis, as usual.

Announcement is made that the copartnership heretofore existing between A. Travis Wells and Morton Minot, under the firm name of Wells & Minot, Brockport, N. Y., was dissolved January 1 by mutual consent. The liabilities of the firm have been assumed by Mr. Minot, to whom accounts due the firm are to be paid and who will continue the business.

The Manhattan Stamping Works, 509 to 515 First avenue, New York, issue a circular containing memorandum of goods on hand which they propose to sell before moving to their new factory, 105 to 111 North Third street, Brooklyn, E. D. It is intended that if any of these goods should be required satisfactory prices can be made. It includes a line of Stamped, Pieced and Japanned Ware.

C. W. DUNLAP & CO., 249 to 253 Plymouth street, Brooklyn, N. Y., issue their discount sheet No. 2, January 15, applying to their catalogue and price list of August, 1884. In it attention is called to the following changes in list prices:

*Cake Turners on Page 6, Change List as Follows:*  
Nos. .... 1 2 3 4 4½ 5 5½  
\$6.50 14.00 15.00 18.00 22.00 22.00 18.50  
*Ice Chisels, Long Handles, Page 16.*

No. 10, we do not make; change list on No. 20 to ..... per doz. \$12.00

*Ice and Snow Scrapers.*

Change list on No. 2 to ..... per doz. \$8.00

*Bake Pans.*

No. 15, list is ..... per doz. \$4.25

The following additional goods which have recently been added to their line are also referred to, and the list prices and discounts given as below:

*Carpet Stretchers.*

No. 3, same pattern as No. 2, but larger, \$4.50 per doz. dis. 25 %

*Mincing Knife.*

No. 40, Ex. Heavy, 2 Blade, \$24 per gross dis. 10 %

*Bread Knife.*

No. 6, for Hotel and Restaurant. Whole length 18 inches, Extra Heavy, Best Cast-Steel Blade, \$12 per gross.

*Pinchin Irons.*

We make a Short one (whole length 7 inches).

Price same as others.

*Box Chisels.*

*Sliding Door Locks—Double Doors.*  
No. 160, 4½ x 3½ inches, Plain Brass Front and Bolts, with 4 Flush Cup Escutcheons.  
No. 165, 4½ x 3½ inches, Plain Bronze Front and Bolts, with 4 Flush Cup Escutcheons.  
No. 170, 4½ x 3½ inches, Ornamental Bronze Front and Bolts, with 4 ornamental Flush Cup Escutcheons.  
No. 175, 4½ x 3½ inches, Ornamental Iron Bronze Front, Brass Bolt, with 4 Flush Cup Escutcheons.  
No. 180, 4½ x 3½ inches, Astragal, Plain Brass Front and Bolt, with 4 Flush Cup Escutcheons.  
No. 185, 4½ x 3½ inches, Astragal, Plain Bronze Front and Bolts, with 4 Flush Cup Escutcheons.  
No. 190, 4½ x 3½ inches, Astragal, Ornamental Iron Bronze Front and Bolt, with 4 Ornamental Flush Cup Escutcheons.  
No. 195, 4½ x 3½ inches, Astragal, Ornamental Iron Bronze Front, Brass Bolts, with 4 Flush Cup Escutcheons.  
Keys for Locks Nos. 160, 170, 175, 180, 185, 190, 195, are Class No. 125.  
*Mortise Front Door Locks and Vestibule Latches.*  
No. 540, 4½ x 3½ inches, Lacquered Iron Front, Iron Bolts, Plated Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.  
No. 545, 3½ x 3½ inches, Vestibule Latch to match Lock No. 540.  
No. 545, 4½ x 3½ inches, Lacquered Iron Fronts, Brass Bolts, Plated Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.  
No. 545½, 3½ x 3½ inches, Vestibule Latch to match Lock No. 545.  
Keys for Locks Nos. 540, 545, are Class No. 115. Nickel Night Keys for Locks Nos. 540, 540½, 545, 545½, are Class No. 130.

*Mortise Front Door Locks and Vestibule Latches.*

No. 550, 4½ x 3½ inches, Brass Fronts and Bolts, Plated Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 550½, 3½ x 3½ inches, Vestibule Latch to match Lock No. 550.

Keys for Locks Nos. 540, 545, are Class No. 115. Nickel Night Keys for Locks Nos. 540, 540½, 545, 545½, are Class No. 130.

*Mortise Front Door Locks and Vestibule Latches.*

No. 555, 4½ x 3½ inches, Brass Fronts and Bolts, Plated Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 555½, 3½ x 3½ inches, Vestibule Latch to match Lock No. 555.

No. 560, 4½ x 3½ inches, Plain Bronze Fronts and Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 560½, 3½ x 3½ inches, Vestibule Latch to match Lock No. 560.

No. 565, 4½ x 3½ inches, Plain Bronze Fronts and Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 565½, 3½ x 3½ inches, Vestibule Latch to match Lock No. 565.

No. 570, 4½ x 3½ inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on Lock Key Bolt, 3 Tumblers on Night Key Bolt, 2 Small Nickel Night Keys, 24 Changes.

No. 575, 3½ x 3½ inches, Vestibule Latch to Match Lock No. 570.

No. 575½, 3½ x 3½ inches, Vestibule Latch to Match Lock No. 575.

No. 580, 4½ x 3½ inches, Ornamental Bronze Front and Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 585, 3½ x 3½ inches, Vestibule Latch to Match Lock No. 580.

Nickel Keys for above Locks are Class No. 115. Nickel Night Keys for above Locks are Class No. 130.

*Store Door Locks.*

No. 880, 4½ x 3½ inches, Upright Rim Store Door Dead Lock, Heavy Iron Bolt, 2 Nickel-Plated Filing Steel Keys, 1 Tumbler.

No. 885, 5 x 3½ inches, Horizontal Rim Store Door Dead Lock, Heavy Iron Bolt, 2 Nickel-Plated Filing Steel Keys, 1 Tumbler.

No. 890, 6 x 4½ inches, Horizontal Rim Store Door Dead Lock, Heavy Iron Bolts, 2 Nickel-Plated Filing Steel Keys, 1 Tumbler.

No. 895, 6 x 4½ inches, Horizontal Rim Store Door Knob Lock, Heavy Iron Bolts, 2 Nickel-Plated Filing Steel Keys, 1 Tumbler, Reversible for Right or Left Hand.

Keys for above Locks are Class No. 100.

*Horizontal Rim Knob Locks.*

Reversible for Right or Left Hand.

No. 1305, 6 x 3½ inches, Iron Bolts, Tinned Mailable Iron Key, 1 Tumbler.

No. 1310, 6 x 3½ inches, Iron Bolts, Brass Keys, 1 Tumbler.

No. 1315, 6 x 3½ inches, Brass Bolts, Brass Keys, 1 Tumbler.

No. 1340, 6 x 3½ inches, Iron Bolts with Slide Bolt, Threaded Mailable Iron Key, 1 Tumbler.

No. 1325, 6 x 3½ inches, Iron Bolts with Slide Bolts, Brass Key, 1 Tumbler.

No. 1330, 6 x 3½ inches, Brass Bolts with Slide Bolt, Brass Key, 1 Tumbler.

Keys for Locks Nos. 1305, 1320, are Class No. 130. Keys for Locks Nos. 1310, 1320, 1325, 1330, are Class No. 135.

A Western hardware man sends us the following careful and detailed

*Criticism of Paper Boxes,*

in which he points out some prevalent faults and calls attention to what he considers the points of a good paper box for shelf use. Our readers in the trade will recognize the force of his suggestions, which may perhaps be of interest and of service also to manufacturers. Our correspondent says:

The discussion now taking place relative to arrangement of model Hardware stores brings to my mind a subject upon which I have long desired to express myself, as well as to hear the views of the retail trade at large. This subject is the packing of Shelf Hardware in paper boxes. I am on the side of those who think that the paper boxes look handsomer as well as more business-like than the wood boxes. There is a vast amount of valuable space on the shelves wasted by the use of the wood box, and it always suggested to me the idea of large store and few goods to fill up with. I have never seen a store where wood sample boxes are used that have the same business air as one where the original paper box is used. On this subject much can be said. I have not the time nor could I reasonably ask the space in these columns that would be required to do this subject justice, but there are some points about the paper box and its covering that are so exceedingly objectionable that I cannot refrain from alluding to them, and if others in the trade view the matter as I do and will so express themselves in this paper the good work of reform in the paper box will then be begun, and I will not feel that my time has been spent for no purpose. The use of the paper box with the lid reaching down to the bottom, thus covering all of the box except the bottom, should become universal. The goods we sell on account of their weight require the strongest box that can be made, and the class of boxes above alluded to makes not only a much stronger but a handsomer box than the old style and gives a large smooth surface for putting on a label. The box and lid should always be protected on corners by pasting cloth over them before the green

satin paper is put on. The box should always be longer than it is wide, so that one can distinguish at a glance which is the long way of the box, for where the width is nearly as great as the length the lid is liable to be put on crossways of the box and thus split nearly all of the corners of the lid open, the box thus remaining an eyesore until all of the goods are sold from it. If the shape of the article to be boxed is such that the box can be made perfectly square this is avoided. A great nuisance for the telescope box, such as is used for boxing Wostenholme's Cutlery, and by some manufacturers of files. If an article is taken out of such a box to show a customer, and the salesman is so unfortunate as not to sell the article, being in a hurry to put the article back in the box he will not fold the paper inside as it left the packing-room, and in the consequence the box is distended, and when the cover is forced on the telescope cover is usually split from one end to the other and in this condition cannot be used. I have no doubt that more bad words have been used from this cause than were ever uttered in putting up stove-pipe. There are other serious objections to this style of box, but the above should be sufficient to make the telescope box a thing of the past. Now, as to the paper covering for Hardware boxes, I think no color can compare with plain green satin paper. The Scotch plaid paper used by manufacturers of Spoons, Gimlets, Auger Bits and some other goods might do for a lining of cheap trunks and satchels, but I cannot see how it ever came to be used as a box covering, unless it originated in the band-box. It is certainly not appropriate for

larger than is absolutely required to hold a given number of chisels, as frequently they cannot be repacked by the clerk as closely as they were at the factory, and the consequence is that the lid has to be forced in the slot, and a broken or split lid, or the box split where it is slotted for the lid, is the result. I would suggest that the word Mortise be used as a substitute for Framing on label of chisels, as the two words Firmer and Framing look so much alike that very frequently when in a hurry a box of one may be opened before you discover it is the other that you desire. I think Augers would be put in wood boxes similar to chisel boxes with good advantage, also Horse Raps. I would be glad to be one to contribute \$5 for the printing of such suggestions as the foregoing, to be printed and addressed, "Hints to Manufacturers," with a large number of signatures of leading men in the Hardware trade appended. Of course the wishes of an individual would scarcely be heeded, but, if the manufacturers felt it was the desire of the many, the manufacturers are too progressive a class of men not to take the hint. Let the dealers ask in their orders for goods of such brands or manufacture as those who have endeavored to get up attractive, as well as substantial, boxes and labels, and the cure will soon be effected.

ARRANGEMENT OF HARDWARE STORES.

A correspondent describing the Nail Counter which is illustrated below, Figs. 1 and 2, writes as follows:

We have just completed a new Nail Counter, Fig. 1, which may be worth a notice.

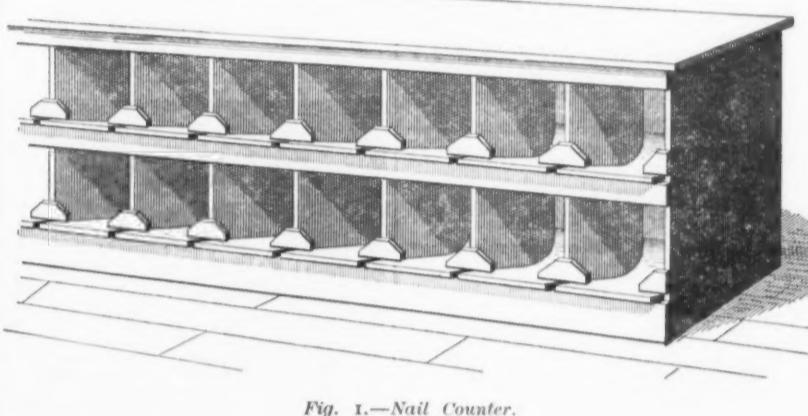


Fig. 1.—Nail Counter.

a shelf-box covering. There are a few boxes, as File and Screw boxes, where the color might deviate from green, but for all Locks and shelf goods nothing produces so pleasing an effect as green. Now, as to the label. This I think should always be green with a heavy black border, and the figures representing the size or number of articles in the box should be as large and heavy as the size of the box will permit. The label on end of box exposed on shelf to view should be for all small boxes, such as Screws, Files, Auger Bits, Augers, Chisels, &c., as free from printers' type, flourishes, year patented or other useless information as possible. On such small packages as these the end of box is from necessity so small that the entire end of box is required in order to get a bold label, on which the figures should be as large and plainly printed as possible, in order that the contents of box can be ascertained at a glance. Every part of the label should be printed; let us have no more Jim Crow labels, part in print and part in writing, like some of the wire Brad packages. I have never seen any goods put up in better style or with such handsome and business-like labels as the Nicholson Files (except their Swell Tapers and Double Enders), Russell & Erwin Mfg. Co.'s Screws, and Wire Brads of the HP Nail Co., of Cleveland. There are a few other manufacturers who have also made progress in labels, but I am sorry to say they are very few. The manufacturers could well pattern after the models above referred to, and the sooner they do the sooner their goods will become popular. In files I never buy anything but a Nicholson File, simply for the reason they are so much more nicely put up than other files. I could always get R. & E. Screws from my jobber I would take nothing else. Disston's Hand Saws would be immensely more desirable if put up in boxes made the same as those used for packing their Butchers' Saws. The Disston Hand-Saw box is an abortion, and if these very enterprising gentlemen had ever retailed a Saw out of such a box I think that day would have ended their present style of Hand-Saw box. The manufacturers of Augers and Auger Bits could get a great pointer on labels by hunting up a R. & E. Screw label. The only good style of Auger-Bit box I have ever seen is one that is put up for the A. F. Shapleigh & Cantwell Hardware Co. The box is green with full covering lid, green label covering almost the entire end of box, with heavy Roman figures. The black label with gilt printing on it seems to be a great favorite with the manufacturers of Auger Bits, Augers and Chisels. This makes the poorest label ever used. Long before the goods reach their destination the bronze powder used on the label is all rubbed off and the size of the article is effaced, thus necessitating a great deal of useless labor in getting out the Caliper Rule to hunt up the size bit wanted. Auger Bits should always be put half dozen in a box, as some sizes are not very saleable but still have to be kept in stock. Frequent handling by fussy customers who always want to go through the whole lot in the box, and from still more annoying practice loaning them out, causes them to become rusty or damaged, and where one dozen are put in a box they last so long that some of the same bits may be loaned out so often as to become injured and dead stock. Where only a half dozen are put in a box the lot can be sold out before they become so rusted and injured.

Where Chisels are put up in wood boxes, the label on end of box should be much larger than is used, so that the size can be seen at a glance. The wood boxes should be further improved by using boxes a little

The Counter is 16 feet long, with 26 bins. Each bin is 14 inches wide by 15 inches high and 18 inches deep. The bottom of each bin has 5 inches fall from front to back, and projects beyond the front of rail C C 2½ inches, Fig. 2, giving room for scoop, so as to avoid spilling the Nails on the floor. This bottom is covered with sheet iron, cut in strips 14 inches wide and 2 feet in length, the front edge being turned down over the edge of the bottom, and the back being rounded, as represented in the cut, to form a round corner at the back, making it easy to clean bins and giving no sharp corners to catch. The division between each bin is covered with a block, as shown in Fig. 1, having the size Nail painted on each end, and which also serves to keep the Nails

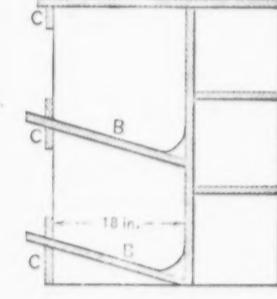


Fig. 2.—Section of Nail Counter.

from coming out at the corners and not into scoop. The back of the counter, as shown in Fig. 2, has bins for Nuts, Washers, Strap Hinges, &c.

Another correspondent sends a description of a very simple rack, which he refers to as convenient for keeping Wire Cloth, Axe, Adze, Sledge and Pick Handles, and which may be used for many other goods. The point he makes for it is its economy of space, convenience and inexpensiveness. He described the contrivance as follows:

It is made of two 2 x 4 scantlings, planed and painted, 1 foot apart, reaching from the floor to the ceiling, and well secured, with gas-pipe pins about 16 inches long and about 16 inches apart on an angle of 45° on the front and rear. On the side small cornice hooks are placed, all of which can be utilized for Stove Pipe Wire, Stove Shovels, Pokers and many other goods. The point he makes for it is its economy of space, convenience and inexpensiveness. He described the contrivance as follows:

Respecting the taxation of commercial travelers a dispatch from Washington says the scope of the recent decision of the Supreme Court is not fully understood. The decision only covers discriminating taxes. The question as to the right of States to levy on commercial travelers the same license tax exacted of local dealers will come before the Supreme Court in a short time, in a case appealed from the Supreme Court of Tennessee. It is claimed that this taxation of salesmen selling by sample is a barrier to the further part of the storage of Wood Weather Strips and other long articles.

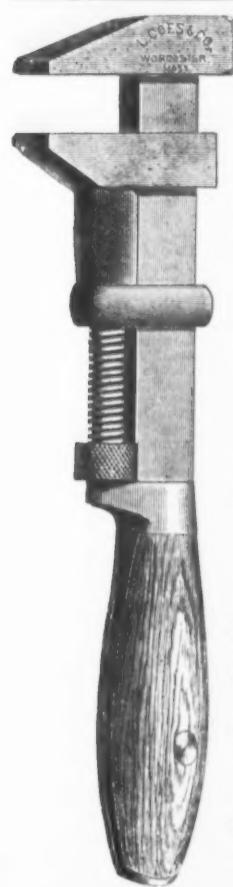
Some time since we reported that the contract for the new bridge at Omaha, Neb., had been taken at a low figure. It is stated that the price was 3½ cents per pound at Chicago. This, it is said is the lowest on record in this country for the class of work.

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending Jan. 26, 1886:

*Hardware.*

Boker Hermann & Co.	Brown Bros. & Co.	Quan. Val.
Hardware, cutlery & guns, pkgs, 63	Rivet rods, coils, 498	Spikes, kegs, 100 \$94
Berbercker J. & Co.	Coddington T. B. & Co.	Closets, cs., 122 3,013
Nails, cs., 16	Cutter Brokers	Tacks, cs., 4 69
Drexel, Morgan & Co.	Spiiegel, tons, 396	Saw mills, 2 104
Arms, cs., 7	Crank-pins, 36	Steel, pkgs, 15 112
Dodge Alfred.	Wire rope, coil, 1	<i>Porto Rico.</i>
Misc., cs., 4	Naylor & Co.	Spikes, pkgs, 10 46
Field Alfred & Co.	Pig, tons, 287	Nails, kegs, 9 23
Augers, cs., 14	Plock & Co.	Clothespins, 1 25
Fuchs & Lang.	Spiegel rods, coils, 264	Tinware, 1 23
Machin'ry, pkgs, 11	Per. caps, case, 1	Rome.
Folsom H. & D.	Perkins, 1	Rifles, cs., 3 245
Arms, case, 1	Perkins, 1	Rome.
Bundles, 236	Plates, cs., 1	Rifles, cs., 3 245
Bells, 7	Pig, tons, 150	Rifles, cs., 3 245
Frassee P. A. & Co.	Plock & Co.	Rome.
Arms, cs., 2	Spiegel, tons, 1500	Rifles, cs., 3 245
Graet's Cutlery Co.	Stetson Geo. W. & Co.	Rome.
Caskets, 11	Tinplate, cs., 1	Rifles, cs., 3 245
Herr		



L. COES'  
GENUINE IMPROVED  
Knife Handle  
PATENT

### Screw Wrenches

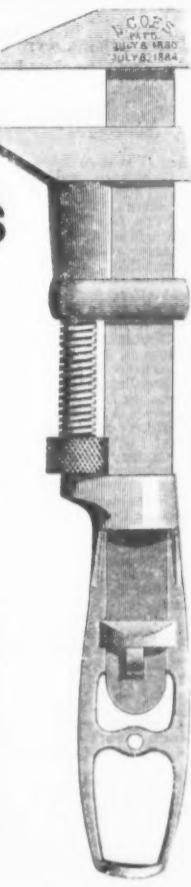
MANUFACTURED BY  
L. COES & CO.,  
Worcester, Mass.  
ESTABLISHED IN 1830.

Patented July 6, 1880.  
Patented July 8, 1884.  
Registered March 31, 1874.

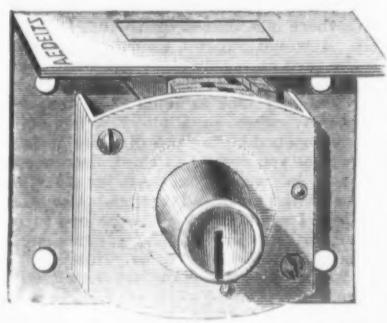
Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.  
Straight Bar, Extra LONG NUT FOR SCREW IN JAW.

The Best Made and Strongest Wrench in the Market.  
Send for Illustrated Price List and Circular.

J. C. McCARTY & CO.,  
NEW YORK,  
Sole Agents.



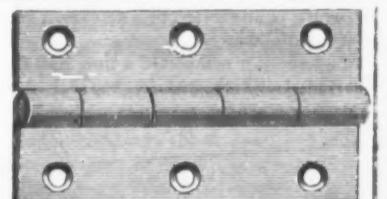
### A. E. DEITZ.



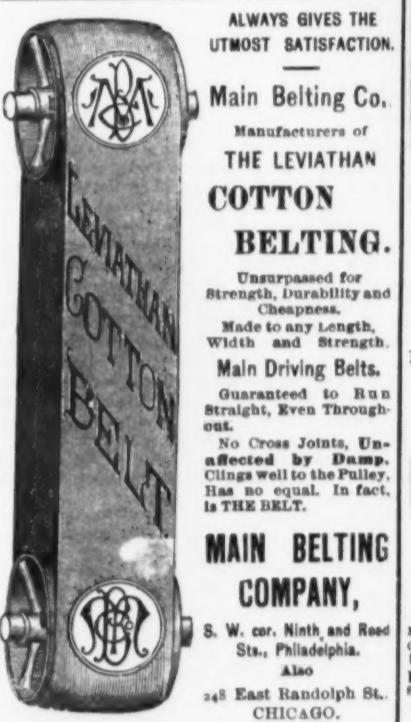
J. C. McCARTY & CO., Agents,

97 Chambers and 81 Reade Sts.,

NEW YORK.



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MANUFACTURERS OF  
BRASS, GALVANIZED & SHIP CHANDLERY  
HARDWARE.  
Nos. 16 & 18 Chambers Street,  
NEW YORK.



BRYANT'S PATENT  
EGG BEATERS.  
SIMPLE, PRACTICAL,  
NOVEL.  
Retails at 20 Cents Each.  
Price, \$2.00 per doz. and dis.  
ADDRESS MANUFACTURERS,  
PAINE, DIEHL & CO.,  
12 BANK STREET,  
Philadelphia, Pa.

#### HARDWARE SPECIALTIES.

##### EUREKA CLOTHES DRYER

FOR THE  
Laundry and Kitchen.

10 Arms: 29 Inches Long.  
Of white ash, finished in oil, set in bright japanned castings.

Price, Each, \$1.00.  
One dozen in crates. Weight, 68 pounds.  
Liberal discount to Trade.

John Campbell,  
Manufacturer of  
HARDWARE SPECIALTIES,  
Manchester, N. H.

SEELEY, CHURCH & COMPANY,

PACIFIC COAST AGENTS

FOR EASTERN MANUFACTURERS

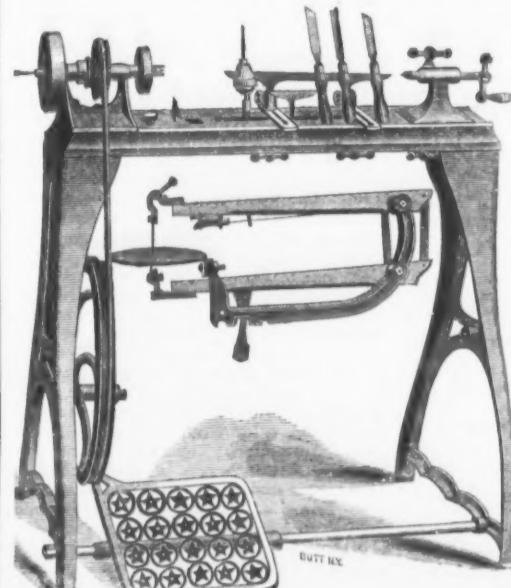
IRON, STEEL, HARDWARE, &c.

Correspondence solicited.

No. 309 California St. (Rooms 6 and 7), San Francisco, Cal.

### WE HAVE ADDED THE GOODELL LATHE AND SAW,

As seen in this Cut, to our Line of SCROLL SAW SUPPLIES for the coming year.



It is by far the best Lathe in market. We have also made great improvements on the

Lester, Rogers and Cricket Saws.

Another generation of boys is coming to the front, so that the demand for these Saws is fast increasing, and seems likely to be as large as it was eight years ago. Dealers can increase their fall trade by laying in a stock.

Goodell Lathe and Tools ... \$10.00.  
Scroll Saw Attachm't, extra ... 2.00.  
Lester Saw and Lathe ..... 10.00.  
Rogers Saw, No. 1 ..... 3.50.  
Cricket Saw, all Iron ..... 2.50.  
Bracket Sets, Nickel Plated, per doz ..... 15.00.  
Bracket Sets, Pleasure and Profit, per doz ..... 10.00.

We are headquarters in New York for Wood, Designs and supplies of all kinds for bracket sawers. Our Star Bracket Blades are superior to any others in use, and are in demand in many other countries.

There is a regular trade discount to all dealers.

MILLERS FALLS CO.,  
74 CHAMBERS STREET, NEW YORK.

### CHAMPLAIN Forged Horse Nails.

MANUFACTURED BY THE  
NATIONAL HORSE NAIL CO.,  
Vergennes, Vermont.

HOT FORGED AND COLD HAMMERED POINTED MADE OF BEST NORWAY IRON AND WARRANTED.

WAREHOUSE  
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DURRIE & McCARTY, Sole Agents.

H. B. SEIDEL, President. W. HASTINGS, Vice-Pres. and Gen'l Mgr. E. T. CANBY, Sec. and Treas.

### THE SEIDEL & HASTINGS CO.

WILMINGTON, DELAWARE,

New York Office, No. 221 Pearl, Corner Platt Street.

MANUFACTURERS OF

### BEST CHARCOAL BOILER PLATES, AND PLATE IRON GENERALLY.

ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we manufacture expressly for the shells of Steam Boilers and stamp 50,000 pounds T. S. when desired. One hundred and sixteen tests of this iron, made during the last three years by the U. S. Inspectors of Steam Vessels, show an average tensile strength of 58,800 pounds to the sectional square inch, and an average reduction of area of the fractured section of 30% per centum. Our prices are as low as the production of a good article will admit of.



BETTS MACHINE CO.,

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MAKERS OF

IMPROVED

MACHINE TOOLS.

### BRASS AND IRON SHIP CHANDLERY HARDWARE.

Yacht Fixtures. Nickel-Plated Canoe Trimmings, Cheapest and Best Side Lights in the Market, Awning Hardware. Specialed in Brass made to Order.

THE SHELTON BRASS HARDWARE CO., Birmingham, Conn.

Send for Illustrated Catalogue.

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### STRONGEST ACME WRENCH AND BEST.



ALL STEEL CASE-HARDENED JAWS. WARRANTED. MANUFACTURED BY  
OWSLEY BROS. & MARBLE, 784 to 794 Madison St., CHICAGO, U. S. A.

Description and Price List Furnished upon Application.

### PURE TURKISH EMERY.

### WALPOLE EMERY MILLS,

South Walpole, Mass.

### Illinois Iron AND Bolt Co., MANUFACTURERS OF HOUSE-RAISING SCREWS.

SEND FOR  
PRICE LIST.



SEND FOR  
PRICE LIST.

### PRESS SCREWS,

FOR PRESSING

Cheese, Wine, Cider, Lard and Tobacco.

ALSO,

Locomotive, Track, Wagon and Bell Base,  
Tripod and Carrying Ratchet

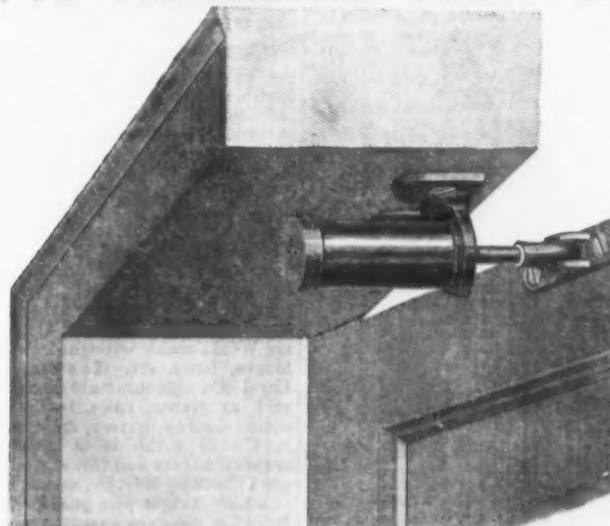
### JACK SCREWS.

NOS. 20 TO 26 MAIN STREET,

CARPENTERSVILLE, Kane Co., ILLINOIS.

WATTS & MANUFACTURING & CO.,  
480 PEARL STREET, NEW YORK,  
SOLE MANUFACTURERS OF THE

### WATTS PNEUMATIC DOOR CHECK.



The Latest Improved, Most Simple and Only Reliable Door Check  
Now on the Market.

It can be applied to either side of the door or on the casing overhead. In fact, the only universal Air Door Check made that can be sold over the counter, not requiring an expert to put it on. Can be applied by anybody, and are sold at about half the price of other Checks. Catalogues and Price Lists furnished on application.

• E. MERRITT & CO. •  
ESTABLISHED 1859 → BROCKTON, MASS.  
The Only Manufacturers of a Complete Line of ♦  
TACK AND NAIL MACHINERY.  
SEND FOR CIRCULAR. UPRIGHT DRILLS.

## INDUSTRIAL ITEMS.

## MAINE.

It is said that Boston parties have leased the iron works and nail factory of the Pennsboro Iron Co., and will start them up in the spring. The above works have been idle since July, 1884.

## NEW HAMPSHIRE.

The directors of the Franconia Iron Co., organized at Concord on the 15th, with John H. Barron, president; C. M. Amsden, vice-president; L. D. Stevens, treasurer and clerk.

The Haley Mfg. Co., recently organized in Concord and composed of Boston and Concord capitalists, have purchased the buildings and land occupied by the Concord Carriage Co., and will immediately fit up the premises for the manufacture of shade rollers. The sum paid was \$10,000, and the property cost originally \$25,000.

The S. C. Forsyth Machine Co., Manchester, at the annual meeting held last week, declared a dividend of \$2 per share.

## MASSACHUSETTS.

The factory at North Hanson formerly occupied by the Standard File Co. has been leased by Kingston parties, and will be used as a tack manufactory.

The Washburn & Moen Mfg. Co., Worcester, are having made a 600 horse power condensing engine from plans furnished by the Armstrong & Sims Engine Co., Providence, R. I.

The main building of the G. W. & F. Smith Iron Foundry Co., Boston Highlands, was destroyed by fire last week, together with its contents, incurring a loss of between \$20,000 and \$30,000. Insurance about \$15,000.

C. H. Brown, Fitchburg, has recently furnished a 250-horse-power engine for the Mason & Hamlin Organ Co., Boston, and one of the same size in the Cleghorn Mill, Fitchburg. He is making a 400-horse-power engine for the American Rubber Co., and one of half that capacity for the L. B. Smith Rubber Co.

## RHODE ISLAND.

During the past two months the Brown & Sharpe Mfg. Co., of Providence, have received more orders than for some time previous. The works are running full time, employing 450 hands.

D. B. Cruickshank, of Providence, has just shipped a 15-horse-power boiler to the Standard Oil Co., Burlington, Vt., and a No. 3 J. B. Davis pump to the American Indurated Fibre Co., of Mechanicville, N. Y. He reports business as improving.

## CONNECTICUT.

Several of the knife-shop hands at Bradleyville work until 9 p. m.

A Bridgeport concern employs 75 people in manufacturing a sewing machine which is held in the hand and used like a hair clipper.

The Southington Cutlery Co.'s employees have, on account of the four or five weeks' strike of the grinders and finishers, sustained a loss of about \$4000.

The wire-drawers' strike at New Haven, which was begun six months ago at E. S. Wheeler & Co.'s East Haven mill, is ended. The strikers claimed to have gained their point, while the firm say that both sides have made concessions.

## NEW YORK.

The old Morrison foundry, at Green Island, has been opened as a machine shop by Andrew Rose.

## NEW JERSEY.

The Watson Machine Co., of Paterson, who build all kinds of machinery, shafting, &c., are now employing about 175 hands. They are exporting considerable work, largely hydraulic presses, sugar machinery and shafting, to Cuba, South America and Mexico.

## PENNSYLVANIA.

The Chesapeake Nail Co., of Harrisburg, have given notice of a 10 per cent. reduction of nailers' wages, to take effect on Monday, the 25th inst. The nailers have not yet decided whether to accept it or not.

The Berwind-White Coal Mining Co., of Philadelphia, capital stock \$2,000,000, were chartered last week to mine coal in Clearfield, Center, Blair, Cambria and Jefferson counties. The company will have control of 17 collieries. The directors are Charles F. Berwind and Allison White, of Philadelphia, and Edward J. Berwind, of New York.

## MISSOURI.

The Glasgow Iron Co., of Pottstown, have become an interested party in the Ellis & Lessig Steel and Iron Co., they having purchased some \$60,000 worth of the stock of that corporation.

The upper shops of the Pennsylvania Railroad Co., at Altoona, have been ordered upon 10 hours' time.

The York Rolling Mill is to be enlarged to accommodate increasing business.

The New York, Pennsylvania and Ohio shops at Meadville are building for the road three Mogul freight engines, with 18 by 24 inch cylinders.

The Bethlehem Iron Co.'s furnace at Bingen blew in on Monday, the 25th inst.

It is thought that the improvements being made at the large furnaces of the Reading Iron Works, at Reading, will not be completed until late in the spring, when it is expected both will go into blast.

The rolling mill and nail factory of Mc-  
Lanahan, Smith & Co., at Hollidaysburg, which have been idle for some weeks, started upon full time last week.

The rolling mill, nail factory and sheet mill of the E. & G. Brooke Iron Co., at Birdsboro', which has been idle for some time, resumed operations on Monday, the 25th inst.

## PITTSBURGH AND VICINITY.

It is reported that H. C. Frick and a number of Pittsburgh iron men will shortly erect a rolling mill at Mount Pleasant. The

mill, it is said, will be built on the Daniel Rumbough Farm. The land referred to is owned by the H. C. Frick Coke Co., and is very desirable location, easily accessible by sidings from both the Baltimore and Ohio and Pennsylvania railroads.

The Pittsburgh Bridge Co. have booked orders to employ the works until April 1; one is for an iron swinging bridge for Chicago.

H. P. Tobey, of Boston, Mass., was in Pittsburgh recently, negotiating with J. P. Whiterow for the purchase and erection of a Clapp-Griffith steel plant at the Tremont Nail Works, West Wareham, Plymouth County, Mass. The works have an annual capacity of 600 tons of nails, and Mr. Tobey's firm contemplate the manufacture of steel nails in future. The arrangements are not yet complete.

One of the three new hammers at W. D. Wood & Co.'s mill, at McKeesport, has been placed in position and the foundation for another has almost been finished.

Work has been resumed at many of the coal works along the Monongahela River in the vicinity of Pittsburgh. The companies have employed towboats breaking the ice about the tipplers to enable them to get coal loaded.

Eastern capitalists are negotiating for the purchase of the plant of the Manchester Iron and Steel Co., in Allegheny. Two or three syndicates are represented. One firm are trying to lease a part of the plant, including the old nail mill and the 26-inch train. Another firm wish to lease the plant for a year as a financial experiment, with a possible view to purchase if it is shown that the investment is profitable. The whole plant has been advertised for several weeks.

## OHIO.

The shaft of the blast engine of the Benwood Nail Co., at Martin's Ferry, was broken last week, throwing the men out of employment until it can be repaired. The Robinson & Rea Mfg. Co., of Pittsburgh, are making a new shaft.

The co-operative nail factory now being erected at Steubenville will start up about February 10.

Secretary C. C. Kelly, of the Union Window Glass Works, at Bellaire, which have been shut down since December, 1884, because of low prices, presented data at a meeting of the stockholders to the effect that all the factories selling glass at the present prices are losing money.

Mr. Stewart H. Chisholm, who has been connected with the Cleveland Rolling Mill Co. for 16 years, and since the death of Henry Chisholm, his father, has been its vice-president, has resigned from that position to assume the presidency of the HP Nail Co., of Cleveland. Mr. Wilson B. Chisholm will succeed his brother in the Cleveland Rolling Mill Co. Mr. C. B. Beach, who has been president of the nail company since its organization in 1878, retired from that position on the 20th inst. There will be no change of the interests of the parties in the respective companies.

The Colliau Furnace Co., of Detroit, recently received an order from the Reading (Pa.) Foundry Co. for two of their large-size furnaces complete. The foundry in question is understood to be the largest single-pipe foundry in the country, measuring 25x72 feet, exclusive of stock building, core-rooms, &c. We may add that the business of the Colliau Furnace Co. is now managed by Messrs. Bryan & Co., of Detroit.

The Calumet Iron and Steel Co., Cummings, are pushing work on repairs with all possible haste, and hope to get their bar mill and all the balance of their works in operation by February 1st. On Saturday last they were working 36 machines in the nail department, and anticipate starting several more this week.

Mr. C. D. Otis, formerly with Hubbard, Spencer, Bartlett Co., and Mr. W. C. Brown have formed a partnership for the sale of hardware, as manufacturers' agents, with their office and salesroom at 154 Lake street, Chicago.

The Secretary of State of Illinois issued license of incorporation to the following companies last week: The Charles Morris Co., at Chicago; capital stock, \$50,000; to manufacture fireworks, toys, &c.; incorporators, Charles Morris, Henry Freeman and George R. Walker. The Iron Age Implement Co., at Chicago; capital stock, \$20,000; incorporators, D. J. Waddell, William J. Whispell and Herman Valmer. The Taylor Steele Fire Car Wheel Co., at Chicago; capital stock, \$500,000; incorporators, Edward L. Harpman, Robert H. Pugh and Henry Hannibal, Jr.

The Union Steel Works, Chicago, will start up about June 1. Great improvements are going on at the steel works, which succeeded the old company, and 400 men are at work there. A new Bessemer steel mill is building and new machinery will be put in. It is understood that the mills will employ at least 1000 men.

## MICHIGAN.

The Colliau Furnace Co., of Detroit, recently received an order from the Reading (Pa.) Foundry Co. for two of their large-size furnaces complete. The foundry in question is understood to be the largest single-pipe foundry in the country, measuring 25x72 feet, exclusive of stock building, core-rooms, &c. We may add that the business of the Colliau Furnace Co. is now managed by Messrs. Bryan & Co., of Detroit.

Amended articles of association have been filed with the Secretary of State by the Superior Iron Co., of Ashland. The name remains the same; the capital stock is established at \$500,000. The object is stated to be to conduct an iron-mining business, and the offices are to be located in Milwaukee.

## MISSISSIPPI.

The Progress Mfg. Co. have been organized at Meridian to succeed the Progress Machine Works of G. W. Soule. The

capital will be either \$100,000 or \$150,000.

A new foundry and machine and wood shops will be built to employ from 100 to 150 hands.

The location has not been decided upon, but will probably be at Meridian.

## MARYLAND.

Mr. Mervin McKaig, of Cumberland, writes us that with his improved machinery for making shafting he is enabled to turn out large quantities at very low prices. Orders are coming in so fast that arrangements are being made to run the shafting department day and night.

## TENNESSEE.

The Standard Charcoal Co.'s furnace, at Goodrich, has just blown in.

The furnaces of the La Grande Iron Co., at Danville, have gone out of blast and will not blow in again till April next.

## VIRGINIA.

The Virginia Nail Works, of Richmond, are unable to keep up with their orders and are now doubling their capacity. For some months they have been behind their orders.

The Roanoke Machine Works have closed a contract with the New York, New Haven and Hartford Railroad Co. for the construction of 100 freight cars for that railroad. The Norfolk and Western Railroad Co. have also given an order to the works for two new engines, to be followed by an order for 17 more. The works are also expecting an order in the early spring for 500 more freight cars. This indicates that these immense works will be kept busy with full force for an indefinite time.

## WEST VIRGINIA.

Mr. O. C. Dewey, formerly of Dewey, Vance & Co., Wheeling, has made an offer to build and equip a nail factory of 60 machines and hand it over to any company for \$50,000. It is said a number of Wheeling nailers are making an effort to raise the money.

The sum of \$10,000 has been subscribed by Wheeling citizens toward the erection of a co-operative nail factory in that city.

The Ensign Mfg. Co., of Huntington, have the following new orders: Ninety box cars for the C. O. and S. W.; 500 box cars and 20 gondolas for the A. and B. S. L.; 12 flat cars for the C. and N.; 26 patent stock cars and one caboose, making in all, 669 cars to make within the next four months.

## GEORGIA.

The new machine shops, now in course of erection at Athens will be completed in about a month. Fifty men will be employed at the start.

## ALABAMA.

The Woodstock Iron Co., Anniston, claimed exemption from taxation for 10 years under the act of the Legislature of 1873. The law was repealed in 1876, and the Calhoun County authorities claimed taxes for the State and county from the date of repeal until 1883, when the limit of exemption expired. In the suit for the taxes the county won before the county commissioners. The company held that they were exempt for the period of the law, as their works were erected between the time of enactment and repeal of the law, and an appeal has been taken to the Supreme Court. Fully \$5000 is involved. In anticipation of arrangements to make steel, the firm have changed their name to the Woodstock Iron and Steel Co.

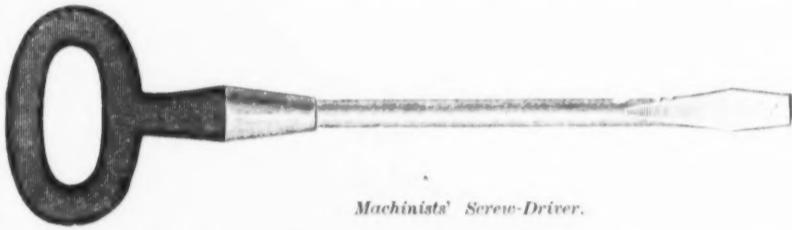
An experimental cargo of Alabama coal has been shipped from Mobile to Havana, Cuba.

Woodstock Furnace No. 1, at Anniston, is just starting again, having been repaired.

## Hardware Novelties.

## Machinists' Screw-Driver.

The accompanying illustration represents the Standard Screw-Driver, which is manufactured by the Standard Tool Co., Cleveland, Ohio. The handle is described as made



Machinists' Screw-Driver.

of iron, and the blade of the best English tool steel. The screw-driver is designated as No. 115, and is made with blade from 4 to 12 inches in length. It is packed half-dozen in a box. The same company have also recently put on the market their Stubbs' steel screw-driver bits, to the quality of which they call attention.

## The Watts Door Check and Spring.

The Watts Mfg. Co., 480 Pearl street, New York, are manufacturing the article above named, and which is illustrated by the accompanying cut, which represents it applied to the door. It consists, it will be observed, of a cylinder open at one end combined with a piston and rod, the one stationary and the other applied to the door, so that when opening the door the piston is drawn entirely from the cylinder and is held in position by a peculiarly constructed spring joint attached to the piston-rod in such a way that it enters the cylinder when the door approaches its closed position. The compression of the air in the cylinder prevents the door from slamming, as it cannot close until the air in the cylinder has had time to escape through an aperture for this purpose, the size of which is regulated by turning the cap, a feature to which the manufacturers call attention as permitting a very simple adjustment. Attention is also called to the fact that the same check can be placed either upon the door or on the

frame. The door opens easily and without the exercise of much force. Another point to which the manufacturers allude is the simplicity of the construction, and the fact that any ordinary person, though unskilled in applying the check, can readily adjust it to the door and casing so that it will operate perfectly. The checks and springs are manufactured with brass cylinders, the fittings being of iron, brass-plated, and the whole highly polished and lacquered. They are also furnished in nickel-plate on special orders. They are warranted not to get out of order, and the manufacturers refer to some principal buildings in this city where they are being used with satisfaction. The door check is made in three sizes—small, medium and large.

## Manufacturing Profits in England.

Mr. Bright, in his great speech at Rochester, in November last, took up at some length the business depression in England. Mr. Bright ascribes this to the overdoing of business in certain branches where there have been within a few years enormous profits made. His remarks on this point were as follows:

If you were to go back for the last 10 years you would probably find that the number of ships—larger ships than ever before—that has been built is so great as to astonish all men understanding the matter as to how those ships were by any possibility to find cargoes. Things were very prosperous. I know a gentleman who told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that his firm, shipowners, made a profit of £10,000

# Current Hardware Prices, January 27, 1886.

## HARDWARE.

### Ammunition.

Caps, Percussion, #1000—	
Hicks & Goldmark's	
F. E. Waterpoof, 1-10's.....	50¢
E. B. Metal Edge, 10-10's.....	60¢
E. B. Ground Edge, Central Fire, 10's, 70¢	25 & 5%
Double Waterpoof, 1-10's.....	\$1.40
Musket Waterpoof, 1-10's.....	50¢
U. S. R. Metal Edge, 10-10's.....	25¢
S. R. Union Metallic Cartridge Co., F. C. Trimmed.....	50¢
Union Metallic Cartridge Co., F. C. Trimmed.....	50¢
E. B. Metal Edge, 10-10's.....	60¢
Cen. Fire Ground.....	70¢
Double Waterpoof.....	\$1.40
Double Waterpoof, in 1-10's.....	\$1.40
B. G. genuine Imported.....	45¢
Eley's D. Waterpoof, Central Fire.....	50¢
Cartridges—	\$1.00
Rim Fire Cartridges.....	60¢
Blank Cartridges.....	15¢
Cen. Fire Cartridges, Pistol and Rifle.....	40¢
Cen. Fire Cartridges, Military & Sporting, 30x2½	
Blank Cartridges, except 22 & 32 cal, an add'l 10% or 15% above discounts.	
Blank Cartridges, 32 cal.....	\$1.50
Blank Cartridges, 32 cal.....	\$1.25
Primed Shells and Bullets.....	25¢
Security Gravity.....	25¢
Gymnastic Primers, all sizes, and R. L. Caps (for Sturtevant Shells).....	90¢
All other Primers, all sizes.....	\$1.10
Shells—	
Paper Shot Shells, 1st & 2d or S. G. quals, 25 & 52½	
Seibold's Combination Shot Shells.....	25 & 52½
Paper Shot Shells, Club, Rival & Climax, 40 & 52½	
Paper Shot Shells, Club, Rival & Climax, 40 & 52½	
Brass Shot Shells, Club, Rival & Climax, 40 & 52½	
Wads—	
C. M. C. & W. R. A. E. E., 11 up.....	22¢
C. M. C. & W. R. A. E. E., 23 up.....	23¢
U. M. C. & W. R. A. E. E., 11 up.....	25¢
U. M. C. & W. R. A. E. E., 11 up.....	31¢
U. M. C. & W. R. A. E. E., 9 & 10.....	40¢
U. M. C. & W. R. A. E. E., 7 & 8.....	49¢
Eley's E. E., 11 up.....	75¢
Eley's E. E., 11 up.....	\$1.20
Anvils.	
Eagle Anvils.....	W b 10¢—dis 20¢
rights.....	94¢
arm's Head, Hole.....	11¢
artizage Mouse Hole, Extra.....	11¢
Trenton.....	9¢
W. K. Riley Carr Patent Solid.....	11¢
Allied Anvils Co., 18¢	20¢
Miller's Falls Co., 18¢	25¢
Cheney Anvil and Vise, \$2.50.....	40¢
Allen Combined Anvil and Vise, \$2.50.....	40¢
Richardson's Vise and Anvil.....	25¢
Apple Parers.	
French, Champion.....	dis 45¢
Empire State.....	dis 47.50
Eureka.....	each \$9.00
Family Bay State.....	each \$12.00
Gen. Parer.....	dis 45¢
Improved Bay State, 1884.....	dis 45¢
Improved Penn, 1884.....	dis 45¢
Jersey Star.....	dis 45¢
Lited Star.....	dis 45¢
Model.....	dis 45¢
New Lighting.....	dis 45¢
Rocking Table, 1883.....	dis 45¢
Turntable.....	dis 45¢
Two-Knife.....	dis 45¢
Waferly.....	dis 45¢
White Mountain.....	dis 45¢
Whittemore's Perfection.....	dis 45¢
Whittemore's Simplicity, "72".....	dis 45¢
"76".....	dis 45¢
"78".....	dis 45¢
Ankers and Bits.	
Goodwin's Co., 10¢.....	dis 70¢
Other First Quality.....	dis 60 & 10 & 50
Snell's, Douglass Mfg. Co., 10¢.....	dis 60 & 10 & 50
John's New Haven Copper Co., 10¢.....	dis 60 & 10 & 50
West Circular Lip.....	dis 60
Mount Solid Head.....	dis 30
E. Jennings & Co., No. 5.....	dis 40 & 10
E. Jennings & Co., No. 30.....	dis 60 & 10
C. E. Jennings' Bit, in family box.....	dis 30
E. Jennings' Quarter, No. 5; No. 30, 45.....	dis 20 & 50
E. Jennings' Patent Single Twist.....	dis 45
West Jennings' Angles and Bits, mitred, new list, dis 10 & 20.....	dis 10 & 20
Bar Bits, New Haven Copper Co., 10¢.....	dis 50 & 10
U. Homedieu Car Bits, 10¢.....	dis 15 & 20
Snell Mfg. Co., Jennings' Bits (new list).....	dis 30
Clark's small, 18; large, 25.....	dis 35 & 55
Ives' No. 4, per doz, 60¢.....	dis 35 & 40
Swan's.....	dis 40
Star No. 1, 80¢; No. 2, 120¢.....	dis 25
Hollow Augers.	
Ives'.....	dis 25 & 10
French, Swift & Co. ....	dis 25 & 10
Drills—	
Syracuse Drills, 30 & 30¢ & 5¢	
Holt's Bit Stock Drills, 25 & 10¢	
Shay's Adjustable, # doz, 42¢.....	dis 40 & 10
Bonney's Adjustable, # doz, 42¢.....	dis 40 & 10
Ives' Adjustable, # doz, 48¢.....	dis 20 & 10
Ives' Expansive, each, \$4.50.....	dis 45 & 50
Universal Expansive, each, \$4.50.....	dis 20 & 10
Gembit Bits.	
Common.....	gross \$3.00
Diamond.....	gross \$10.10
Barrel.....	dis 15 & 20
Double Cut, Shepardson's.....	dis 45¢
Double Cut, C. T. Valley Mfg. Co., 10¢.....	dis 50 & 10
Double Cut, Hartwell's, \$10.50.....	dis 10
Double Cut, Douglass.....	dis 40
Double Cut, Ives.....	dis 50 & 10
Drill Bits.	
Syracuse Drills, 30 & 30¢ & 5¢	
Holt's Bit Stock Drills, 25 & 10¢	
Shay's Adjustable, # doz, 42¢.....	dis 40 & 10
Bonney's Adjustable, # doz, 42¢.....	dis 40 & 10
Ives' Adjustable, # doz, 48¢.....	dis 20 & 10
Ives' Expansive, each, \$4.50.....	dis 45 & 50
Universal Expansive, each, \$4.50.....	dis 20 & 10
Awl Holes.	
Self Holes, Ferrule, \$1.50.....	dis 50 & 10
Patent Sewing, Short, \$1.00.....	dis 40 & 10
Patent Sewing, Long, \$1.20	dis 20 & net
Patent Peg, Flat Top, \$1.00 & gross \$4.50.....	dis 45 & 50
Patent Peg, Leather Top, \$1.00 & gross \$4.50.....	dis 45 & 50
Awl Brad. Sets & Co., 10¢.....	dis 50 & 10
Awl Sets, Awis & Tools, # doz, \$10.00 & 10¢	
A. J. Tool Handles, No. 1, \$12 & 10¢, 25 & 10 & 50	
Brad Sets, No. 42, \$10.50; No. 43, \$12.50, .70s 10 & 50	
Brad Sets, Stanley's Excelsior, No. 1, \$7.50.....	
Brad Sets, Stanley's Excelsior, No. 2, \$10 & 10¢	
Brad Sets, Stanley's Excelsior, No. 3, \$5.50.....	
Axes.	
Best according to brand.....	dis 40 & 50 & 70
Special brands.....	dis 45 & 50 & 60
Axe Grease.	
Keg # 2, 5¢; Pail, # 2, 6¢ net	
French, Swift & Co., # doz, 50¢	
Crates in boxes.	
Axes.	
Nos. 1 to 6.....	Short bed, 4¢
Nos. 7 to 15.....	dis 15 & 20
Nos. 16 to 22.....	dis 20 & 25
Nos. 23 to 35.....	dis 30 & 35
Tubular Wrought Steel (National Self-Oiling):	
Less than 10 sets, dis 35¢	
Over 10 sets, dis 35¢	
Box Holders.	
Bryce's Pat., # doz, 18¢.....	dis 60
Balances.	
Spring Balances.....	dis 50
Chatillon's Spring Balances.....	dis 50
Chatillon's Circular Spring Balances.....	dis 50
Bells.	
Hand Bells.	
Light Brass.....	dis 75.10 & 10 & 80¢
Extra Heavy.....	dis 65.10 & 10 & 70¢
White Metal.....	dis 70 & 10 & 85¢
Silver Clime.....	dis 25.10 & 10 & 50
Globe Clime's Patent.	
Gong, Abbe's.....	dis 25 & 10
Gong, Yankee.....	dis 40 & 10
Gong, Barton's.....	dis 40 & 10
Gong, French's.....	dis 40 & 10
Crank, Brooks'.....	dis 50 & 10 & 25
Crank, Cone's.....	dis 10 & 5
Crank, Connel's.....	dis 20 & 10 & 5
Lever, Taylor's, \$1.00 & net	
Lever, Taylor's Japanned.....	dis 25 & 10 & 6
Lever, R. E. M. Co.'s.....	dis 50 & 10 & 25
Pull, Brooks'.....	dis 50 & 10 & 25
Pull, Western'.	
Common Wrought.....	dis 60 & 10 & 50
Western.....	dis 60 & 10 & 50
W. H. Sargent's list.....	dis 60 & 10 & 50
Kentucky Star.....	dis 70 & 10 & 50
Kentucky, Sargent's list.....	dis 70 & 10 & 50
Dodge, Genuine Kentucky, new list.....	dis 70 & 10 & 50
Nos. 1 to 4, 15 & 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260, 265, 270, 275, 280, 285, 290, 295, 300, 305, 310, 315, 320, 325, 330, 335, 340, 345, 350, 355, 360, 365, 370, 375, 380, 385, 390, 395, 400, 405, 410, 415, 420, 425, 430, 435, 440, 445, 450, 455, 460, 465, 470, 475, 480, 485, 490, 495, 500, 505, 510, 515, 520, 525, 530, 535, 540, 545, 550, 555, 560, 565, 570, 575, 580, 585, 590, 595, 600, 605, 610, 615, 620, 625, 630, 635, 640, 645, 650, 655, 660, 665, 670, 675, 680, 685, 690, 695, 700, 705, 710, 715, 720, 725, 730, 735, 740, 745, 750, 755, 760, 765, 770, 775, 780, 785, 790, 795, 800, 805, 810, 815, 820, 825, 830, 835, 840, 845, 850, 855, 860, 865, 870, 875, 880, 885, 890, 895, 900, 905, 910, 915, 920, 925, 930, 935, 940, 945, 950, 955, 960, 965, 970, 975, 980, 985, 990, 995, 1000, 1005, 1010, 1015, 1020, 1025, 1030, 1035, 1040, 1045, 1050, 1055, 1060, 1065, 1070, 1075, 1080, 1085, 1090, 1095, 1100, 1105, 1110, 1115, 1120, 1125, 1130, 1135, 1140, 1145, 1150, 1155, 1160, 1165, 1170, 1175, 1180, 1185, 1190, 1195, 1200, 1205, 1210, 1215, 1220, 1225, 1230, 1235, 1240, 1245, 1250, 1255, 1260, 1265, 1270, 1275, 1280, 1285, 1290, 1295, 1300, 1305, 1310, 1315, 1320, 1325, 1330, 1335, 1340, 1345, 1350, 1355, 1360, 1365, 1370, 1375, 1380, 1385, 1390, 1395, 1400, 1405, 1410, 1415, 1420, 1425, 1430, 1435, 1440, 1445, 1450, 1455, 1460, 1465, 1470, 1475, 1480, 1485, 1490, 1495, 1500, 1505, 1510, 1515, 1520, 1525, 1530, 1535, 1540, 1545, 1550, 1555, 1560, 1565, 1570, 1575, 1580, 1585, 1590, 1595, 1600, 1605, 1610, 1615, 1620, 1625, 1630, 1635, 1640, 1645, 1650, 1655, 1660, 1665, 1670, 1675, 1680, 1	

**Ladies.**  
Metting, Sargent's.....  
Metting, Reading.....  
Metting, Standard.....  
Metting, P. S. & W. ....  
Metting, Warner's.....

**Lanterns.**

Tubular, Standard No. 0, 2 lbs.....  
Tubular, Standard No. 1, 2 lbs.....  
Tubular, Lift Wire, No. 0, 2 lbs.....  
Tubular, Lift Wire, No. 1, 2 lbs.....  
Tubs for Tubulars, add 2 lbs.....  
Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75  
Porter's Tin, R. R., \$10.00; Medium, \$10.25; Large, \$10.50

**Lawn Mowers.**—Regular List.

Lemon Squeezers.  
Porcelain Lined.....  
Wood, Tinned.....  
Eureka, Tinned.....  
Bunlap's Improved.....  
Samms'.....  
Townsend's Patent.....  
Jewell's "Star".....  
The "Boss".....  
Dean's Nos. I, 2 lbs, \$15.00; 2 lbs, \$20.00; 3 lbs, \$25.00  
Little Giant.....  
Acme.....

**Lines.**

Cotton and Linen Fish, Draper's.....  
Draper's Chalk.....  
Draper's Mason's Linen, \$4.00; No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25; No. 6, \$3.75; No. 7, \$4.25; No. 8, \$4.75; No. 9, \$5.25; No. 10, \$5.75; No. 11, \$6.25; No. 12, \$6.75; No. 13, \$7.25; No. 14, \$7.75; No. 15, \$8.25; No. 16, \$8.75; No. 17, \$9.25; No. 18, \$9.75; No. 19, \$10.25; No. 20, \$10.75; No. 21, \$11.25; No. 22, \$11.75; No. 23, \$12.25; No. 24, \$12.75; No. 25, \$13.25; No. 26, \$13.75; No. 27, \$14.25; No. 28, \$14.75; No. 29, \$15.25; No. 30, \$15.75; No. 31, \$16.25; No. 32, \$16.75; No. 33, \$17.25; No. 34, \$17.75; No. 35, \$18.25; No. 36, \$18.75; No. 37, \$19.25; No. 38, \$19.75; No. 39, \$20.25; No. 40, \$20.75; No. 41, \$21.25; No. 42, \$21.75; No. 43, \$22.25; No. 44, \$22.75; No. 45, \$23.25; No. 46, \$23.75; No. 47, \$24.25; No. 48, \$24.75; No. 49, \$25.25; No. 50, \$25.75; No. 51, \$26.25; No. 52, \$26.75; No. 53, \$27.25; No. 54, \$27.75; No. 55, \$28.25; No. 56, \$28.75; No. 57, \$29.25; No. 58, \$29.75; No. 59, \$30.25; No. 60, \$30.75; No. 61, \$31.25; No. 62, \$31.75; No. 63, \$32.25; No. 64, \$32.75; No. 65, \$33.25; No. 66, \$33.75; No. 67, \$34.25; No. 68, \$34.75; No. 69, \$35.25; No. 70, \$35.75; No. 71, \$36.25; No. 72, \$36.75; No. 73, \$37.25; No. 74, \$37.75; No. 75, \$38.25; No. 76, \$38.75; No. 77, \$39.25; No. 78, \$39.75; No. 79, \$40.25; No. 80, \$40.75; No. 81, \$41.25; No. 82, \$41.75; No. 83, \$42.25; No. 84, \$42.75; No. 85, \$43.25; No. 86, \$43.75; No. 87, \$44.25; No. 88, \$44.75; No. 89, \$45.25; No. 90, \$45.75; No. 91, \$46.25; No. 92, \$46.75; No. 93, \$47.25; No. 94, \$47.75; No. 95, \$48.25; No. 96, \$48.75; No. 97, \$49.25; No. 98, \$49.75; No. 99, \$50.25; No. 100, \$50.75; No. 101, \$51.25; No. 102, \$51.75; No. 103, \$52.25; No. 104, \$52.75; No. 105, \$53.25; No. 106, \$53.75; No. 107, \$54.25; No. 108, \$54.75; No. 109, \$55.25; No. 110, \$55.75; No. 111, \$56.25; No. 112, \$56.75; No. 113, \$57.25; No. 114, \$57.75; No. 115, \$58.25; No. 116, \$58.75; No. 117, \$59.25; No. 118, \$59.75; No. 119, \$60.25; No. 120, \$60.75; No. 121, \$61.25; No. 122, \$61.75; No. 123, \$62.25; No. 124, \$62.75; No. 125, \$63.25; No. 126, \$63.75; No. 127, \$64.25; No. 128, \$64.75; No. 129, \$65.25; No. 130, \$65.75; No. 131, \$66.25; No. 132, \$66.75; No. 133, \$67.25; No. 134, \$67.75; No. 135, \$68.25; No. 136, \$68.75; No. 137, \$69.25; No. 138, \$69.75; No. 139, \$70.25; No. 140, \$70.75; No. 141, \$71.25; No. 142, \$71.75; No. 143, \$72.25; No. 144, \$72.75; No. 145, \$73.25; No. 146, \$73.75; No. 147, \$74.25; No. 148, \$74.75; No. 149, \$75.25; No. 150, \$75.75; No. 151, \$76.25; No. 152, \$76.75; No. 153, \$77.25; No. 154, \$77.75; No. 155, \$78.25; No. 156, \$78.75; No. 157, \$79.25; No. 158, \$79.75; No. 159, \$80.25; No. 160, \$80.75; No. 161, \$81.25; No. 162, \$81.75; No. 163, \$82.25; No. 164, \$82.75; No. 165, \$83.25; No. 166, \$83.75; No. 167, \$84.25; No. 168, \$84.75; No. 169, \$85.25; No. 170, \$85.75; No. 171, \$86.25; No. 172, \$86.75; No. 173, \$87.25; No. 174, \$87.75; No. 175, \$88.25; No. 176, \$88.75; No. 177, \$89.25; No. 178, \$89.75; No. 179, \$90.25; No. 180, \$90.75; No. 181, \$91.25; No. 182, \$91.75; No. 183, \$92.25; No. 184, \$92.75; No. 185, \$93.25; No. 186, \$93.75; No. 187, \$94.25; No. 188, \$94.75; No. 189, \$95.25; No. 190, \$95.75; No. 191, \$96.25; No. 192, \$96.75; No. 193, \$97.25; No. 194, \$97.75; No. 195, \$98.25; No. 196, \$98.75; No. 197, \$99.25; No. 198, \$99.75; No. 199, \$100.25; No. 200, \$100.75; No. 201, \$101.25; No. 202, \$101.75; No. 203, \$102.25; No. 204, \$102.75; No. 205, \$103.25; No. 206, \$103.75; No. 207, \$104.25; No. 208, \$104.75; No. 209, \$105.25; No. 210, \$105.75; No. 211, \$106.25; No. 212, \$106.75; No. 213, \$107.25; No. 214, \$107.75; No. 215, \$108.25; No. 216, \$108.75; No. 217, \$109.25; No. 218, \$109.75; No. 219, \$110.25; No. 220, \$110.75; No. 221, \$111.25; No. 222, \$111.75; No. 223, \$112.25; No. 224, \$112.75; No. 225, \$113.25; No. 226, \$113.75; No. 227, \$114.25; No. 228, \$114.75; No. 229, \$115.25; No. 230, \$115.75; No. 231, \$116.25; No. 232, \$116.75; No. 233, \$117.25; No. 234, \$117.75; No. 235, \$118.25; No. 236, \$118.75; No. 237, \$119.25; No. 238, \$119.75; No. 239, \$120.25; No. 240, \$120.75; No. 241, \$121.25; No. 242, \$121.75; No. 243, \$122.25; No. 244, \$122.75; No. 245, \$123.25; No. 246, \$123.75; No. 247, \$124.25; No. 248, \$124.75; No. 249, \$125.25; No. 250, \$125.75; No. 251, \$126.25; No. 252, \$126.75; No. 253, \$127.25; No. 254, \$127.75; No. 255, \$128.25; No. 256, \$128.75; No. 257, \$129.25; No. 258, \$129.75; No. 259, \$130.25; No. 260, \$130.75; No. 261, \$131.25; No. 262, \$131.75; No. 263, \$132.25; No. 264, \$132.75; No. 265, \$133.25; No. 266, \$133.75; No. 267, \$134.25; No. 268, \$134.75; No. 269, \$135.25; No. 270, \$135.75; No. 271, \$136.25; No. 272, \$136.75; No. 273, \$137.25; No. 274, \$137.75; No. 275, \$138.25; No. 276, \$138.75; No. 277, \$139.25; No. 278, \$139.75; No. 279, \$140.25; No. 280, \$140.75; 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No. 334, \$167.75; No. 335, \$168.25; No. 336, \$168.75; No. 337, \$169.25; No. 338, \$169.75; No. 339, \$170.25; No. 340, \$170.75; No. 341, \$171.25; No. 342, \$171.75; No. 343, \$172.25; No. 344, \$172.75; No. 345, \$173.25; No. 346, \$173.75; No. 347, \$174.25; No. 348, \$174.75; No. 349, \$175.25; No. 350, \$175.75; No. 351, \$176.25; No. 352, \$176.75; No. 353, \$177.25; No. 354, \$177.75; No. 355, \$178.25; No. 356, \$178.75; No. 357, \$179.25; No. 358, \$179.75; No. 359, \$180.25; No. 360, \$180.75; No. 361, \$181.25; No. 362, \$181.75; No. 363, \$182.25; No. 364, \$182.75; No. 365, \$183.25; No. 366, \$183.75; No. 367, \$184.25; No. 368, \$184.75; No. 369, \$185.25; No. 370, \$185.75; No. 371, \$186.25; No. 372, \$186.75; No. 373, \$187.25; No. 374, \$187.75; No. 375, \$188.25; No. 376, \$188.75; No. 377, \$189.25; No. 378, \$189.75; No. 379, \$190.25; No. 380, \$190.75; No. 381, \$191.25; No. 382, \$191.75; No. 383, \$192.25; No. 384, \$192.75; No. 385, \$193.25; No. 386, \$193.75; 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No. 440, \$220.75; No. 441, \$221.25; No. 442, \$221.75; No. 443, \$222.25; No. 444, \$222.75; No. 445, \$223.25; No. 446, \$223.75; No. 447, \$224.25; No. 448, \$224.75; No. 449, \$225.25; No. 450, \$225.75; No. 451, \$226.25; No. 452, \$226.75; No. 453, \$227.25; No. 454, \$227.75; No. 455, \$228.25; No. 456, \$228.75; No. 457, \$229.25; No. 458, \$229.75; No. 459, \$230.25; No. 460, \$230.75; No. 461, \$231.25; No. 462, \$231.75; No. 463, \$232.25; No. 464, \$232.75; No. 465, \$233.25; No. 466, \$233.75; No. 467, \$234.25; No. 468, \$234.75; No. 469, \$235.25; No. 470, \$235.75; No. 471, \$236.25; No. 472, \$236.75; No. 473, \$237.25; No. 474, \$237.75; No. 475, \$238.25; No. 476, \$238.75; No. 477, \$239.25; No. 478, \$239.75; No. 479, \$240.25; No. 480, \$240.75; No. 481, \$241.25; No. 482, \$241.75; No. 483, \$242.25; No. 484, \$242.75; No. 485, \$243.25; No. 486, \$243.75; No. 487, \$244.25; No. 488, \$244.75; No. 489, \$245.25; No. 490, \$245.75; No. 491, \$246.25; No. 492, \$246.75; No. 49

# WHOLESALE METAL PRICES, January 27, 1886.

## METALS.

**IRON.**—DUTY: Bars, 8-10¢ to 11-10¢ per lb.; provided that no Bar Iron shall pay a less rate of duty than 35¢. Sheet, 11-12¢ to 15-16¢ per lb.; Band, Hoop and Scroll, 1¢ to 1-4-10¢ per lb.; Railings, Bars, weighing more than 25 lb. per yard, 7-10¢ per lb.

### Standard American Pig Iron.

Foundry No. 1 A. ... \$18.00 per ton  
Foundry No. 2 X. ... 17.00 @ 17.50  
Gray Forge. ... 16.00 @ 16.50

### No. 1 Scotch Pig Iron.

Carnarvon. ... 18.00 per ton  
Coltness. ... 20.50 @ 21.00  
Shotts. ... 20.00 @ 20.50  
Glenarnock. ... 19.50 @ 20.50  
Gartes erie. ... 20.50 @ 21.00  
Langholm. ... 19.50 @ 20.00  
Stuimeriee. ... 19.00 @ 19.50  
Innellington. ... 18.00 @ 18.50  
Erlington. ... 18.50 @ 19.00  
Clyde. ... 18.50 @ 19.00

### Hails.

Steel, at Eastern mills. ... \$34.00 per ton  
Old Rails, T's. ... 22.00

### Scrap.

Wrought, per ton, from yard. ... 22.50

### Bar Iron from Store.

Common Iron: 2¢ to 1 in. round and square. ... 1.75 @ 1.80  
Round Iron: 2¢ to 1 in. ... 1.75 @ 1.80

2¢ to 2 in. round and square. ... 1.9 @ 2.35  
1 to 6 in. 2¢ to 1 in. ... 1.95 @ 2.45  
1 to 6 in. 2¢ to 3-16. ... 1.95 @ 2.45  
Rods—4 and 11-16 round and sq. ... 1.8 @ 2.35  
Bands—1 to 6x16 to No. 13. ... 1.9 @ 2.55  
Burden's Best Iron, base price. ... 1.9 @ 2.55  
Burden's H. B. & S. Iron, base price. ... 1.9 @ 2.55  
Norway Nail Rods. ... 5 @ 6¢

### Sheet Iron from Store.

Rolled Iron: 2¢ to 1 in. round and square. ... 1.75 @ 1.80  
2¢ to 2 in. round and square. ... 1.9 @ 2.35  
1 to 6 in. 2¢ to 1 in. ... 1.95 @ 2.45  
1 to 6 in. 2¢ to 3-16. ... 1.95 @ 2.45  
Rods—4 and 11-16 round and sq. ... 1.8 @ 2.35  
Bands—1 to 6x16 to No. 13. ... 1.9 @ 2.55  
Burden's Best Iron, base price. ... 1.9 @ 2.55  
Burden's H. B. & S. Iron, base price. ... 1.9 @ 2.55  
Norway Nail Rods. ... 5 @ 6¢

### IRON WIRE.

**Market Wire.**—Put up in 63 lb bundles. Nos. 0 to 9. 10, 11, 12, 13, 14, 15, 16, 17, 18. 10 11 12 13 14 15 16 17 18. Bright Market Wire. ... 67¢ @ 67¢  
Annealed Market Wire. ... 67¢ @ 67¢  
Coppered Market Wire. ... 62¢ @ 62¢  
Galvanized Market Wire. ... 57¢ @ 57¢  
Fence Wire. ... 67¢ @ 67¢  
Stone or Weaving Wire. ... 67¢ @ 67¢  
Cast Steel, Steel Wire list. ... 50¢ @ 50¢  
**Brass and Copper Wire.**  
Old English Gauge the Standard.—Diss 30 @ 25.  
Common High Low and Gilding Brass Brass Copper.  
All Nos. to No. 16, inclusive. ... \$0.30 \$0.30 \$0.30  
Nos. 17 and 18. ... .33 .37 .37  
19 and 20. ... .34 .38 .38  
21. ... .25 .29 .29  
22. ... .26 .30 .30  
23. ... .28 .32 .32  
24. ... .30 .34 .34  
25. ... .32 .36 .36  
26. ... .35 .39 .39  
27. ... .36 .42 .42  
28. ... .42 .46 .46  
29. ... .45 .49 .49  
30. ... .48 .52 .52  
31. ... .51 .55 .55  
32. ... .55 .59 .59  
33. ... .59 .63 .63  
34. ... .64 .68 .68  
35. ... .70 .74 .74  
36. ... .76 .80 .80  
37. ... .80 1.04 1.04  
38. ... 1.30 1.34 1.34  
39. ... 2.00 2.00 2.00  
40. ... 2.60 2.60 2.60  
Spring Wire, 2 cents per pound advance. White wire, 2 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more, 2 cents per pound extra.

### AMERICAN CAST STEEL.

For American Steel, see Pittsburgh quotations.

### CHROME STEEL.

Too Steel, ordinary sizes, 2¢ to 3 inches, net. ... 10 @ 14¢  
Adamantine Shoes and Dies. ... 8 @ 12¢  
Magnet Steel. ... 14 @ 16¢

### ENGLISH STEEL.

Best Cast. ... 15 @ 15¢  
Extra Cast. ... 15 @ 15¢  
Circular Saw Plates. ... 15 @ 15¢  
Round Machinery, Cast. ... 15 @ 15¢  
Swaged, Cast. ... 15 @ 15¢  
Best Double Shear. ... 15 @ 15¢  
Blister, 1st quality. ... 15 @ 15¢  
German Steel, Best. ... 15 @ 15¢  
2d quality. ... 15 @ 15¢  
3d quality. ... 15 @ 15¢  
Sheet Cast Steel, 1st quality. ... 15 @ 15¢  
2d quality. ... 15 @ 15¢  
**TIN.**—DUTY: Plates, Sheets, Tags, and Terne, 1¢ per lb.; Bars, Block and Pigs free.

Charcoal Tin Plates.

I C 10x14, 225 sheets. ... \$0.25 @ 7.25  
I C 12x12, 225 sheets. ... 5.25 @ 7.50  
I C 20x28, 112. ... 10.50 @ 14.50  
I X 10x14, 225 sheets. ... 6.25 @ 9.25  
I X 12x12, 225 sheets. ... 6.35 @ 9.50  
I X 14x20, 112. ... 6.25 @ 9.25  
D C 12x17, 100. ... 5.00 @ 5.50  
D X 12x17, 100. ... 6.25 @ 7.00  
For each additional X add... 1.25 @ 2.00

### Coke Tin Plates.

Best. Ordinary  
I C 10x14. ... \$4.25 \$4.65 @ ...  
I C 12x12. ... 4.87¢ @ 4.75 @ ...  
I C 10x20, gutters, 225 sheets. 5.00 @ 7.25  
I C 20x28, 112 sheets. ... 10.25

### TERNE PLATES.

Prime Char. 2d, quality Coke.  
I C 10x20, F. \$0.87 1/2 @ 7.00. ... \$0.75  
I C 12x20, Old Process. ... 14.00

### COOPER.

\$4.75 @ 4.87¢  
I X 14x20. ... 6.25 @ 6.75  
I C 20x28. ... 9.25 @ 9.75  
I C 10x14, 12.75 @ 14.50  
I C 12x12, 13.50 @ 15.00

### COPPER.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 3¢ ad valorem.

Ingot. ... 115¢ @ 12¢  
Ingot, Baltimore. ... 11 @ 115¢  
Ingot, Anchor. ... 115¢ @ 115¢

### Brass' Copper, ordinary sizes,

under 16 oz. and over 12 oz. ... 17¢  
sq. ft. ... 21¢

Brass' Copper, 10 oz. and 12 oz. ... 21¢

Lighted lamp 10 oz. 1/2 sq. ft. ... 23¢

Circles less than 8 in. in diam. ... 21 @ 24  
" 8 in. diam. and over. ... 24

Segment and Pattern Sheets. ... 21 @ 24

Locomotive Fire-Box Sheets. ... 20 @ 24

Sheathing Copper, over 12 oz. ... 20 @ 24

sq. ft. ... 15¢ @ 16¢

Bolt Copper. ... 19 @ 20¢

Copper Bottoms. ... 20 @ 20¢

Nickel-Plated Sheathing. ... 20 @ 20¢

Plating extra. ... 20 @ 20¢

Fiat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes. ... 22 @ 22¢

### Tinning.

14¢ by the case. ... \$ sheet, 8¢

14¢, less than case. ... 10¢

Boiler sizes, 7 and 8 in. ... 10¢

Boiler sizes, 9 in. ... 15¢

Other sizes not larger than 8x30. ... \$ sq. ft., 2¢

Larger than 8x30. ... 5¢

Siver-Plated Sheet Copper for Amalgamating, prices furnished upon application.

For tinning both sides, double the above amount.

**O'Neill's Patent Planished Copper.**, Net.

14 and 16 oz. and heavier. ... By the case. ... \$ per lb.

12 oz. and lighter. ... 30¢ @ 28¢

7 in. 14x52. ... 6.50, 14x52. ... 9 in. 14x60.

14 and 16 oz. and heavier. ... By the case. ... \$ per lb.

(And all sizes not over 20 in. wide.) ... 24¢ @ 26¢

14 and 16 oz. and heavier. ... \$ per lb.

12 oz. ... 34¢

Planished Brass same price as Planished Copper.

### Copper Wire. (See Wire.)

Sheathing Metal. ... 18¢ @ ...

**BRASS AND GERMAN SILVER.**

Brown & Sharpe's Gauge the Standard for Metal;

Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884. ... dis. 30 @ 30¢

**LEAD.**—DUTY: Pig, \$2 per 100 lb.; Old Lead, 2¢ per lb.; Pipe and Sheet, 3¢ per lb.

American. ... 4.80 @ 5¢  
ar. ... 6.4¢ @ 5¢

Block Tin Pipe. ... 40¢

Tin Lined Pipe. ... 15¢, 20¢

Sheet. ... 7.4¢, 10¢

Shot, 1/2 bag. ... Drop, \$1.35; Buck, \$1.60

Chilled shot, 1/2 bag. ... \$1.60

Black Paint, in oil. ... 11¢, 12¢, 13¢

Blue Prussian, fair to best. ... 10¢ @ 11¢

" Chinese dry. ... 7¢, 8¢, 9¢

" Ultramarine. ... 11¢, 12¢, 13¢

" Brown Spanish. ... 11¢, 12¢, 13¢

" Van Dyke. ... 10¢ @ 11¢

Dryers, Patent American. ... asstd'd cans, 9¢; kegs, 7¢

Green Chrome. ... 10¢ @ 11¢

" Paris. ... 10¢ @ 11¢

" in oil. ... good, 20¢; best, 25¢

Iron Paint, Bright Red. ... 10¢ @ 11¢

" Brown. ... 10¢ @ 11¢

" Purple. ... 10¢ @ 11¢

Litharge. ... 10¢ @ 11¢

Mineral Paints. ... 10¢ @ 11¢

Red Lead American. ... 10¢ @ 11¢

" Venetian (Eng.) dry. ... 10¢ @ 11¢

" asstd'd cans, 11¢; kegs, 8¢

" Indian Dry. ... 10¢ @ 11¢

Rose Pink. ... 10¢ @ 11¢

Sienna, American Raw, powdered. ... 10¢ @ 11¢

" Burnt, powdered. ... 10¢ @ 11¢

" Raw, powdered. ... 10¢ @ 11¢

Umber, Burnt, powdered. ... 10¢ @ 11¢

Vermilion, Chinese. ... 10¢ @ 11¢

" English. ... 10¢ @ 11¢

White Lead, American, pure dry. ... 10¢ @ 11¢

" in oil. ... 6¢ @ 6¢

Oils.

Bisected Whale, 1/2 gal. ... 54¢ @ 55¢</p

## MECHANICAL.

## The Beaudry Upright Cushioned Power Hammer.

The accompanying illustration shows the latest improvements in the Beaudry upright hammer, which was put on the market about two years ago, and was illustrated and described in our columns at that time. Briefly repeating, however, we may note that the hammer is made entirely of iron and steel, with bronze or other anti-friction metal on all important bearings. The hammer ram is lifted by means of a duplex helve through the intervention of a special lifting belt. This is an endless raw-hide many-plied belt, which passes double through a slot in the upper section of the hammer ram. Through loops thus formed in each end of the strap the rounded ends of the duplex helve pass and are secured there by a nut and a bronze spool. This arrangement secures a square, positive stroke, for the slot through which the strap passes is sufficiently large to allow for the traveling of the strap as it manipulates the hammer ram. The back ends of the duplex helve pass through a journal resting in pillow-

blocks. Here they are secured and cushioned by rubber on all sides, so that all recoil is taken up and all danger of breakage removed.

The steel arms of the duplex helve spring with each stroke, so that the machine is relieved from sudden strains. This, with the elasticity imparted by the lifting belt and rubber springs, renders the blow exactly like that given by the blacksmith's hand hammer—elastic, but not crushing. For this reason no jar is perceptible in the working parts when the blow is struck. The stroke is directed by the foot of the operator from any of the three working sides of the hammer. The keys holding both upper and lower dies are driven in from the front, and the use of a long bar in driving them out from the rear is thus avoided. This is a valuable consideration in adjusting dies where accuracy is required. When the

## Burning Dust Fuel.

Referring to our recent article on "Dust Fuel for Boilers," in which we spoke of the difficulties in the way of satisfactorily burning anthracite culm, the United States Rocking Grate Bar Co., of Chicago, Ill., direct our attention to their rocking grates, for which, as some of our readers may remember, a number of important advantages are claimed. The device was shown in our columns some two years ago, and we need not, therefore, refer to it here in detail. The essential feature of the grate consists in an arrangement of "clips" so fastened to the grate bar as to allow of different sized ori-fices being formed in the bed by the action of a hand lever. This action removes the cinder and clinker without the use of hand

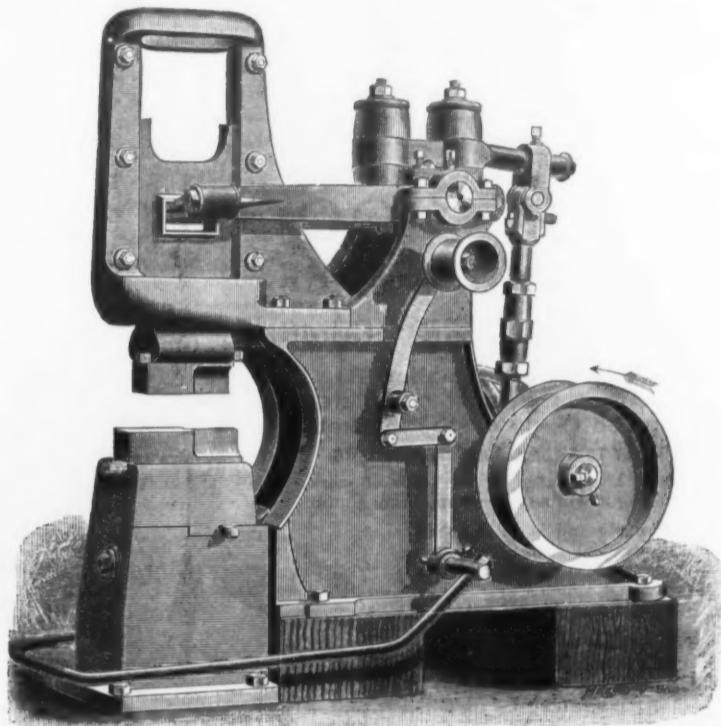
arrangements are very perfect. The gearing is cut in the most accurate manner, and is inclosed in oil-tight housing and runs constantly in oil, and the wear is reduced to a minimum. The blower is driven by chain-wheels and chain belting, and the speed is multiplied by cut gears. The blast is discharged on the under side at the end and taken to the tuyere in a pipe with only one elbow. The different parts are all made to standard size, and any part may be duplicated. The blower is constructed entirely of metal, with no lining of plaster-of-paris or other perishable material. Messrs. Cooke & Co., of 22 Cortlandt street, New York, are the selling agents.

## Corrugated Furnace Flues.

The practical value of a corrugated surface to the furnaces of marine and land boilers is now so well known and so universally admitted that we need not here point it out. The recognition of this is perhaps best testified by the fact that more than 10,000 corrugated furnaces have been applied to boilers of all forms of construction

thus compressing the confined steam the live steam passes through the port 10 and acts upon the piston G, moving it and the valve F. The port 7 is thus closed and the port 4, for admitting live steam to the cylinder, opened. The exhaust on the other side of the piston C is also opened by 6 to M, and the piston accordingly commences to move the other way. The exhaust of the steam decreases the pressure in the port 10, and the steam in the valve-chest, therefore, acting upon the rod of the valve-piston G, drives the latter back before the main piston C uncovers the port 5, and then the steam coming through 5 and 11 holds G in place. The steam coming through 10 causes the pressures to balance at opposite sides of the piston G, and hence the latter remains in its normal position. The whole action is, of course, repeated at the other end of the stroke. It may be argued with good reason that, if from any obstruction the valve should be moved just sufficiently to exactly cover both steam ports 4 and 7, the pump might come to a stand still. To prevent this, however, the ports 12 and 15 (Fig. 3)

where the valve lifts bodily and is parallel to the seat the water does not escape freely to the side where the greatest quantity passes to the port, and the supply is somewhat throttled. Where the valve is hinged at



The Beaudry Hammer, Built by Beaudry &amp; Cunningham, Boston, Mass.

blocks. Here they are secured and cushioned by rubber on all sides, so that all recoil is taken up and all danger of breakage removed.

The steel arms of the duplex helve spring with each stroke, so that the machine is relieved from sudden strains. This, with the elasticity imparted by the lifting belt and rubber springs, renders the blow exactly like that given by the blacksmith's hand hammer—elastic, but not crushing. For this reason no jar is perceptible in the working parts when the blow is struck. The stroke is directed by the foot of the operator from any of the three working sides of the hammer. The keys holding both upper and lower dies are driven in from the front, and the use of a long bar in driving them out from the rear is thus avoided. This is a valuable consideration in adjusting dies where accuracy is required. When the

## Roots' New Acme Hand Blower.

The Roots New Acme Hand Blower, made by Messrs. P. H. & F. M. Roots, of Connersville, Ind., and shown in the annexed cuts, commend itself to the attention of blacksmiths and metal-workers. It has been freed from all complications and reduced to the lowest elements of simplicity. While its size, it is claimed, has been reduced to a compass of less than a man's hat, it will produce a blast of greater strength and volume than the largest size of the unwieldy bellows. The revolvers are inclosed in an iron case, which is bored out perfectly true,

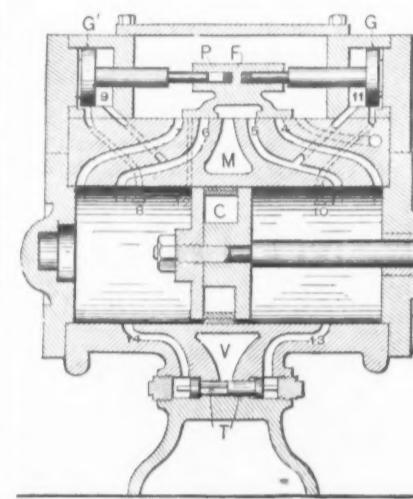


Fig. 1.—Longitudinal Section.

## THE CARRICABURU IMPROVED STEAM PUMP.

during the existence of Fox's patents, and have enabled engineers to use high pressures, before utterly impracticable, ranging from 100 pounds to 180 pounds per square inch, with furnaces only  $\frac{1}{2}$  inch to  $\frac{1}{4}$  inch thick, and as large as 4 feet 8 inches internal diameter. The great resistance to collapse shown by the flue is an important feature, the ratio being as 4.5 : 5 in favor of corrugation. As an evidence that the advantages of these furnaces are becoming widely known, and the flues increasingly adopted, particularly with high grades of expansion, we find in an English paper a tabular statement which shows the number of steamships having triple or quadruple expansion engines and boilers fitted with Fox's corrugated furnaces, made by the Leeds Forge Co., of Leeds, England, during the year 1885. According to this there were 189 steamships with 1656 of Fox's corrugated furnaces.

## The Carricaburu Steam Pump.

One of the most ingenious steam pumps which we have seen for some time and that has many good features to recommend it has been brought out by Mr. Leon B. Carricaburu, of New York, and is shown in our annexed engravings. Of these Fig. 1 represents a longitudinal section of both steam and water cylinders, and readily explains the whole arrangement. The principal feature of the pump is to be found in the valve, which is of the steam actuated type. This valve, which is marked F in the cut, is moved by two small pistons, G and G', working in special cylinders, as shown. The steam and exhaust ports for the pump cylinder are marked 4, 5, 6 and 7, while 10 is a port from this cylinder into a cylinder containing the valve piston G, and 8 a similar port to the cylinder containing the piston G'; 11 and 9 are ports between the exhaust ports 5 and 6 and the cylinders G and G' respectively. Presuming the parts to be in the position shown,

are provided, passing down into the steam cylinder, and holes are drilled through the valve so that when the latter is in the position mentioned these holes correspond with the ports 12 and 15, as shown in the top view of the valve and seat, and let steam pass into the cylinder. The steam will then act through the ports 8 or 10 upon which ever valve-moving piston is to be moved further to complete the movement of the valve. The openings in the valve F naturally correspond with the ports 12 and 15 only at the middle of the valve travel, and the ports are closed at all other times. It may be added that when the valve F is in its center, and the ports 12 and 15 are open into the steam cylinder, if the steam piston C is covering one of the ports 10 or 8, and thereby obstructing the operation of the valve motion, the steam admitted by 12 and 15 will act upon the steam piston, moving it until the port 10 or 8 that had been covered is uncovered, and the steam acting through this port upon the valve-moving piston will remove the valve from its central position. It will readily be seen that there is therefore absolutely no dead point in the travel of the valve F, and the pump will start from any point as soon as steam is admitted. Water of condensation is removed from the cylinder in the following manner:

Beneath the cylinder is a small valve-chamber, T, which is tubular, and provided with caps at the ends and valves with triangular guide-stems in the smaller inner portion of the tubular chamber T. The combined length of the two valve-stems is greater than the distance between the seats for the valves, and there are ports 13 and 14 from the ends of the chamber T to the steam cylinder, and a lateral discharge-pipe between the valve-seats, which may be provided with a cock. When steam acts on one side of the piston C, the pressure closes the valve upon which it acts, opening at the same time the other valve, so that water of condensation can run off at the exhaust side from the cylinder. These operations are automatic, the valves closing and opening in opposite directions at each admission of steam to the cylinder. A chamber, V, is moreover provided, and also a circumferential channel around the steam cylinder to connect the exhaust port M with the lateral discharge-pipe already mentioned, so that any water of condensation in the rising exhaust steam pipe may be at liberty to run down at once into the chamber V, and pass away with the water of condensation from the steam cylinder. Two small blocks of wood or other similar material, one of them being marked P in the cut, are arranged in the valve F to act as buffers for the rods of the independent pistons G and G'.

It will be noticed that neither pump nor steam cylinder has any stuffing-box for the rod D, its place in each case being supplied by a long sleeve, strengthened by ribs A A', and furnished with a brass bushing, as shown. Turning to the water cylinder B of the pump, the reader will find several novel features. Mr. Carricaburu, as will be seen, employs spring-valves of peculiar construction, which not only lift from their seats, but also swing to an angle, thus allowing an unobstructed passage of the water. These valves do not require any hinge, and the seat is easily kept clean and free from foreign substances. The heads of the valve-chest are removable at either side to give access to the valves. These are seen from different points of view in Figs. 1 and 2, and require no special explanation. The water to be pumped first enters the chamber B, thence passes through one of the lower set of valves, according to the direction of travel of the piston, and finally through one of the upper set. Referring again to the valves, it may be added that

one side it does not lift free from the seat, and any solid substance in the water is liable to be thrown upon the seat near the hinge, because there is not sufficient rush of water to prevent the same lodging. Mr. Carricaburu's arrangement avoids all this in a very

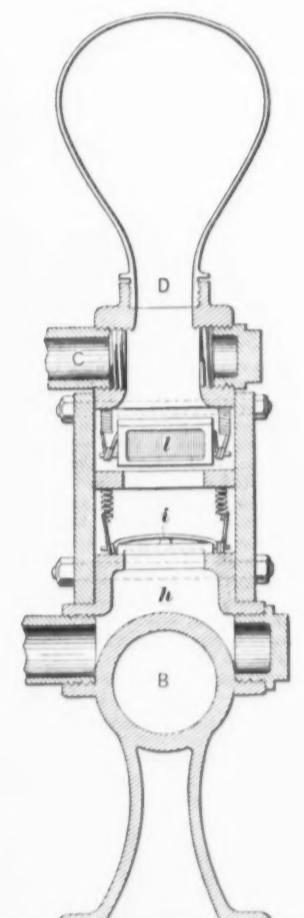


Fig. 2.—Cross-Section of Water Cylinder, Showing Valves.

simple way, and a free discharge all around the valve is secured. Mr. Carricaburu has also designed several duplex pumps, all embodying interesting and valuable features.

We recently had occasion to examine one of the pumps which we have described, and, from all that we could find, very satisfactory

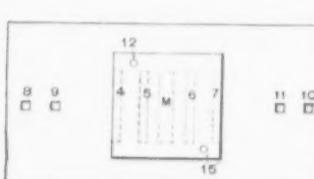


Fig. 3.—Top View of Valve and Seat.

work was being performed. The requirements of simplicity, durability and compactness have evidently been thoroughly satisfied, and, while we cannot speak as to its efficiency, there certainly seems to be reason to expect a creditable performance. Mr. Carricaburu's address is 37 West Forty-seventh street, New York.



Fig. 1.—Elevation.



Fig. 2.—Longitudinal Section.

THE ROOTS NEW ACME HAND BLOWER, MADE BY MESSRS. P. H. & F. M. ROOTS, CONNERSVILLE, IND.

hammer is not in use the dies always stand apart, ready for use, and the distance between them can be varied from actual contact to 6 inches or more in the smaller sizes, and 15 inches or more in the larger sizes. These variations can be made by means of the adjustable regulator, making the hammer especially valuable in jobbing shops, where material differing greatly in size has to be worked. The simple and practical design of the hammer, of which the

and is only about 12 x 9 x 8 inches in size. The revolvers, which are of iron, are constructed on an entirely new principle, and are dressed, so that they will keep up perfect and continuous contact with each other and the case during the entire revolution, thus forcing forward and utilizing all the air taken into the case. The shafting is steel of the best quality. The bearings are of phosphor-bronze, arranged so that they can be easily renewed in a short time. The oil-

the steam is passing through the port 7 and the piston is moving to the right, and the exhaust 5 is open by the valve to M. As soon as the piston C passes or covers the ports 5 and 13 the steam in the cylinder is confined, and prevents the piston C striking the cylinder-head. The distance between the port 10 and the cylinder-head is greater than the thickness of the piston-rod, and the steam, therefore, enters the port 10 as soon as the piston uncovers it; while the piston is

**The Puddling Capacity of Great Britain.**

The Iron and Coal Trades Review has issued an almanac for 1886 in which is published a list of the firms in the United Kingdom manufacturing finished iron, the name of the works owned by each firm and the number of puddling furnaces at work and idle. It is a long time since such a return has been drawn up in detail, and great changes have taken place during the last 20 years. It has been repeatedly asserted—and, indeed, the statistics bear this out—that the finished-iron industry is waning, owing to the steady advance of steel. It is only within the last five years that statistics of production have been collected, and these show that in 1881 the output was 2,681,150 tons; in 1882, 2,841,534 tons; in 1883, 2,730,504 tons, and in 1884, 2,237,535 tons; so that the trade yet remains a most important one; and if, as is predicted by competent authorities, the days of puddling are numbered, it seems as if the number of days would still be large, for it is only in two or three branches that steel has superseded iron. A list of the puddling furnaces should, therefore, be quite as useful as one of blast furnaces. The summary of the list from the almanac is as follows:

England and Wales.		
Name and situation of works.	At work.	Idle.
Cheshire.....	23	0
Cumberland.....	11	27
Denbighshire.....	30	20
Derbyshire.....	47	41
Durham.....	407	987
Glamorganshire.....	195	100
Lancashire.....	321	61
Monmouthshire.....	70	71
Nottinghamshire.....	14	4
Shropshire.....	154	4
Somersethire.....	18	0
Staffordshire, North.....	353	75
Staffordshire, South.....	1,305	288
Worcestershire.....	156	37
Yorkshire, Cleveland.....	300	102
Yorkshire, West Riding.....	382	162
Scotland.....	294	117
Totals in Great Britain.....	4,069	1,581

Twenty years ago 6,407 furnaces were at work; in 1872—the brashest period the malleable-iron trade has ever known—there were 7,311, and in 1875 7,575, the largest number reported. Since that year the number working has rapidly fallen off, and this year only 4,059 are returned as working and 1,581 as idle. The number of establishments engaged in the manufacture of puddled iron was 332 in 1878, against only about 250 at present.

The Committee on Uniform Standard Time of the American Society of Civil Engineers have made an interesting report in respect to the progress of the 24-o'clock system and uniform standard time. They reported that 171 railroads, operating 60,000 miles, were ready to join the movement to abandon all use of "a. m." and "p. m." and some urged no delay. The Canadian Pacific had determined to take the initiative, and a telegram received during the meeting announced that it had already gone into operation. Time-tables were printed, all watches and clocks on the road were being changed, and the Northern Pacific and other Northwestern roads had the same steps under consideration.

Messrs. Bolckow, Vaughan & Co. have decided to make certain alterations and extensions in their steel-making plant. Inasmuch as they have hitherto had only two Siemens furnaces, the produce of which in ingots could not exceed 300 tons per week, it was quite clear that they would be driven to put up more. Their plate and angle rolling machinery is equal to at least 1,000 tons per week, and requires about 1,400 tons of ingots to keep them in full operation. The recent decision of Lloyd's Committee, excluding for the present all basic steel from being used in shipbuilding, has no doubt compelled the step in question as the only alternative against allowing this part of their plant to remain idle. There is now considerable danger of steel-making by the Siemens process being overdone, even in the North of England, where hitherto manufacturers have been rather behindhand. Thus, in addition to the new plant about to be put down by Messrs. Bolckow, Vaughan & Co., and the extensive plant of the Consett Iron

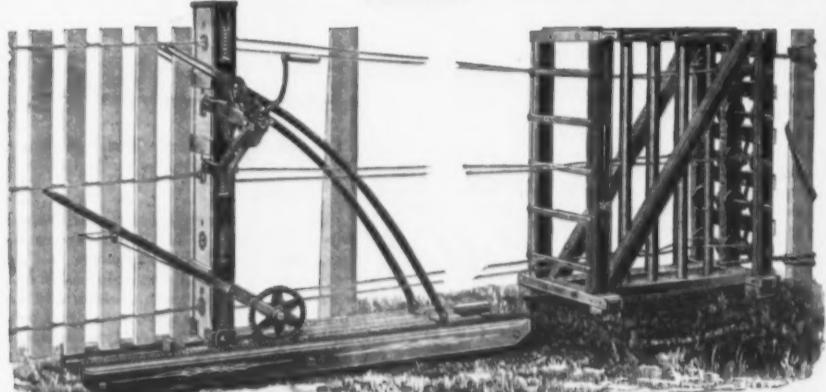
Co., there are the steel works just completed by Palmer's Shipbuilding and Iron Co., at Jarrow, and also a somewhat smaller works in operation at Spennymoor. Besides these there are not less than three steel-melting plants for the purpose of making castings, viz., that of Spencer & Sons, at Newburn, near Newcastle; that of the Wolsingham Steel Co., and that of Messrs. Butler Brothers, at Middlesboro'. There is scarcely sufficient work in ship and boiler building to employ fully all these places, but they are being put down, no doubt, more with regard to future than to present needs.

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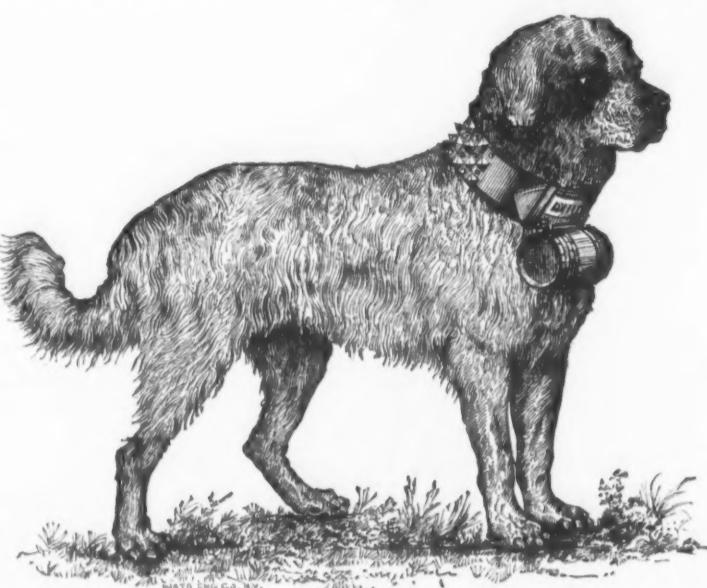
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**New Machinery for Hardware Manufacturers.**

Messrs. John Adt & Son, of New Haven, Conn., are now putting on the market a number of improved machines specially designed for the manufacture of hardware. Of these we show several in the accompanying engravings.

Fig. 1 represents a gang of four machines for drilling door butts and other hardware. At the top and front is a sliding carriage or chuck for holding the work; at the bottom is a drill spindle, with a protection to prevent chips getting into its bearings. The carriage is operated by a steel feeding-screw in the rear, running through a split nut which is connected with the small lever.

automatic in operation, taking wire from the coil and turning out the completed articles very rapidly.

The automatic wire-forming machine shown in Fig. 3 is designed for cutting and forming wire into various shapes, including screw-eye blanks, buckle frames and bows, suspender, D, oval and round rings, belt hooks and an almost endless variety of other articles. They are furnished with various motions, as may be required for bending or stamping the wire into the desired shape. Articles that are very difficult to be made, and are sometimes handled several times over on other machines, can be made on this style of machine at one operation. It takes the wire directly from the coil and produces

**Liquid Fuel.**

Referring to some of the existing practical difficulties in the way of successfully using petroleum for steam raising, the London *Engineer* says:

Petroleum in all its varied forms is too well known to render it necessary that we should say much about it here. An average sample contains—carbon, 85 per cent.; hydrogen, 13 per cent., and oxygen, 2 per cent. Its calorific value is very high, because of the large quantity of hydrogen. Petroleum oils are of almost endless composition, and are obtained by distillation from petroleum or crude rock oil, as it is sometimes called. Petroleum will evaporate theoretically about 18 pounds of water per pound of oil. Petroleum oil is of higher value, as it will evaporate as much as 25 pounds of water per pound. Its calorific value may be taken as  $2\frac{1}{2}$  times that of coal, while the value of the crude oil is a little less than twice that of coal. In practice, however, no such results have ever been obtained; and because attention is being once more directed to the subject, and hopes may be formed which cannot be realized, it is well that we should say something of the practical difficulties which stand in the way.

In order to give liquid fuel every advantage, we shall take the value of coal in the following comparison at  $9\frac{1}{4}$  a ton—that is 0.05d. per pound. The lowest price at

smoke itself does not necessarily represent much loss of fuel, but the deposited soot does, because it coats the heating surfaces with an admirable non-conductor; and there is a strong tendency to the production of what is known as greasy soot, which clings and sticks, and can only be got rid of with much trouble. To prevent smoke the oil must be burned with a large supply of air in a brick-lined chamber, which will prevent the rapid cooling of the gas and partial extinction of the flame. This entails a very important modification in the structure of a boiler for reasons which will be apparent hereafter. The only possible place where liquid fuel may be used with advantage by English engineers is at sea; but any attempt to use it in the existing boilers practically deprives them of the heating surface of the furnaces, because these must be lined with fire-brick if combustion is to be complete. The bulk of the work will be transferred to the combustion chamber and tubes, and this would entail a high chimney temperature and consequent waste if the combustion chamber temperature was raised above what it now is when coal is burned. It appears certain that the total efficiency of a marine boiler burning liquid fuel instead of coal must be lowered. This is a simple deduction from theoretical considerations, but it has hitherto been borne out in practice, for the Himalaya, the steamer which recently made a run to Leith with liquid fuel,

in the boilers, and this entails constant risk of incrustation. Indeed, when the voyages are long and the pressures high it would be impossible to work at all in this way, and steam would have to be furnished by a supplementary boiler working with salt water at a low pressure; or else special distilling apparatus must be provided to furnish fresh water to the main boilers. We have here a second and very serious obstacle to the use of liquid fuel at sea.

The great merit which is claimed for liquid fuel is that, owing to its superior efficiency, either a much smaller quantity of it than of coal may be carried, or that a given weight of it will take a ship much further than would a similar quantity of coal. It is for this reason that it is being tried in the navy. We shall grant, for sake of argument, that liquid fuel may be carried with as much safety as coal. Bulk for bulk, however, it will occupy about as much space. If, however, it can be shown that a ton of liquid fuel will do as much as  $1\frac{1}{2}$  tons of coal, then space may be saved or the duration of cruises prolonged. It may also be urged, and with justice, that the number of hands required in the stokehole will be largely reduced. Such points as these are well worth consideration in the navy, and we are glad to see that an experiment is being tried with liquid fuel. In the mercantile marine petroleum has no chance whatever; the price must always prove fatal to its success. In the navy price is a secondary consideration, and as a fuel for war-ships it may yet be adopted. But it must not be forgotten that even a small shell exploded in a mineral-oil tank would produce the most appalling results. The principal point to be decided is, however, the possibility of burning the oil to advantage at sea. This has yet to be proved. Until this is done it may be mere waste of paper to point out objections to the use of a comparatively volatile inflammable fluid as a fuel. The next point to be decided is the possibility of getting it at a sufficiently low price. Experiences on the Caspian are valueless, because liquid fuel can be had there for next to nothing.

**The Mason Pressure Regulator.**

The accompanying cut illustrates a new pressure regulator for steam pumps, manufactured by the Mason Regulator Co., New York. It is designed to automatically maintain any desired pressure against which a steam pump is working, such as in automatic sprinkler service, water-works systems, &c. The regulator is set in the steam-inlet pipe and the pressure admitted underneath a phosphor-bronze diaphragm through the small

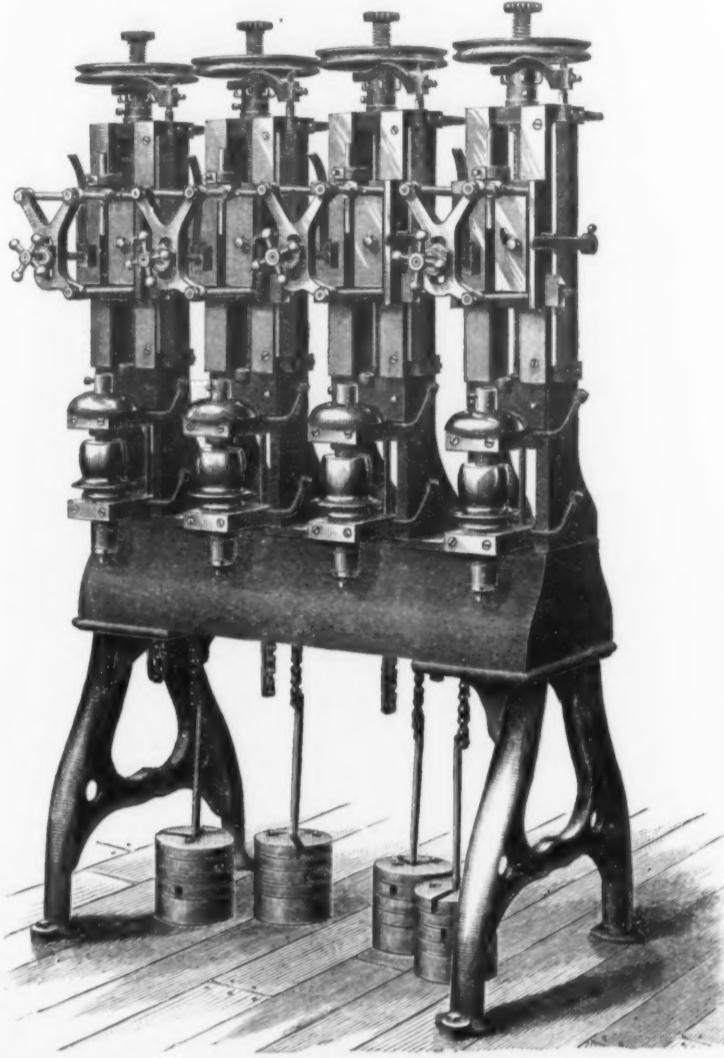


Fig. 1.—Semi-Automatic Butt and Hardware Drilling Machine.

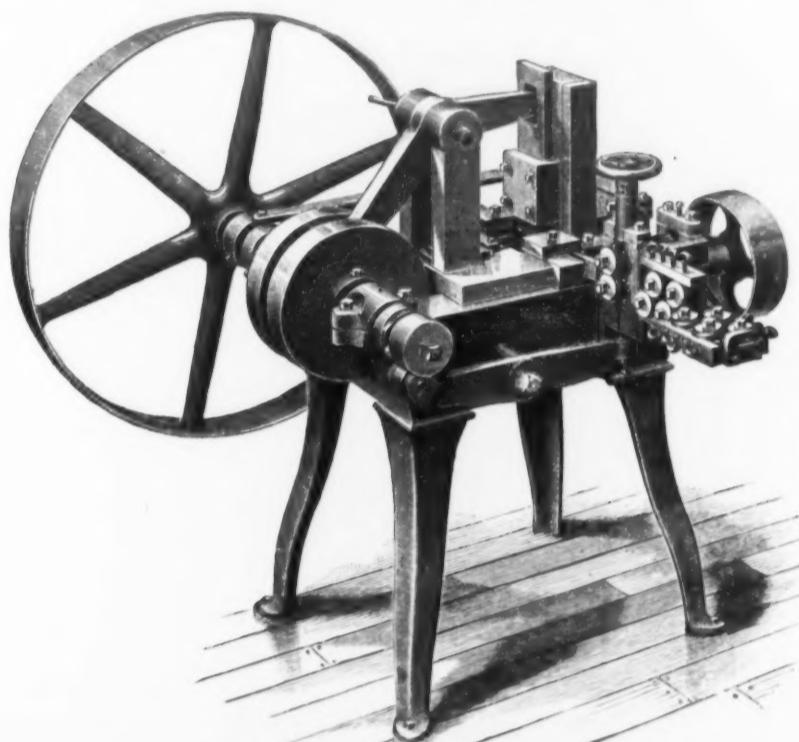


Fig. 2.—Wire-Forming Machine with Double Cam Motion.

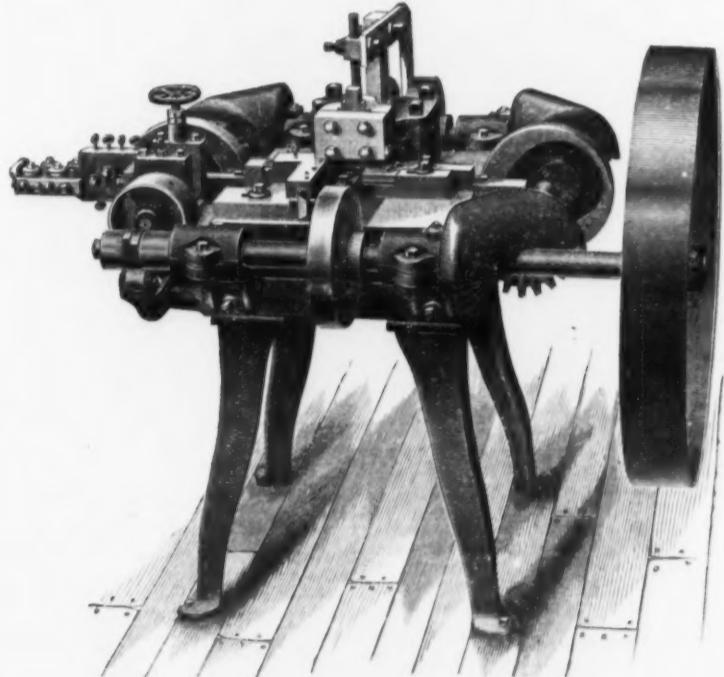


Fig. 3.—Automatic Wire-Forming Machine.

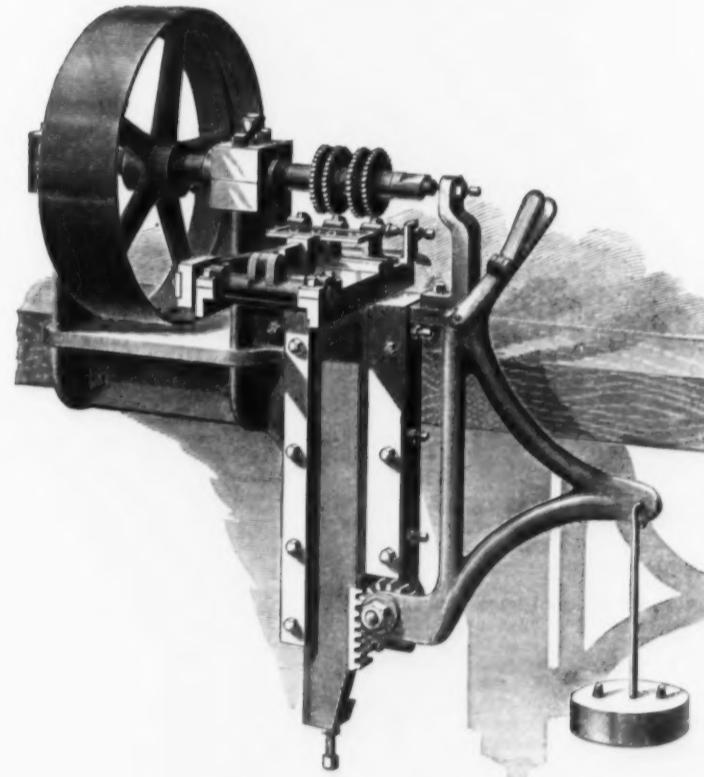


Fig. 4.—Butt Milling Machine.

**NEW MACHINERY FOR HARDWARE MANUFACTURERS, BUILT BY MESSRS. JOHN ADT & SON, NEW HAVEN, CONN.**

The operator, after placing the article to be drilled in the chuck, starts the machine by closing the nut with a slight motion of the lever. The carriage then moves toward the drill and continues until it has reached the proper depth, which is regulated by a sliding gauge on the side of the machine, when the nut instantly opens and allows the carriage to slide back to its former position. It is so arranged that should the drill become dull before reaching the proper depth the feed will stop, and the carriage slide back immediately. Both the spindle and feed-screw are run by belts from horizontal counter-shafts in the rear. One boy can operate 10 machines. The engraving represents the smallest number which it is recommended to mount.

A wire-forming machine is shown in Fig. 2. This machine is intended for making articles that require both vertical and horizontal motions, including diamond and lance-pointed and barbed staples. The arrangement of tools is such that the changes necessary for a variety of work can be easily made by a good machinist. It is entirely

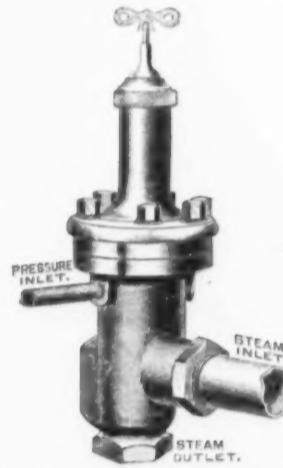
the article. It can be adapted for using square or flat wire as well as round.

Fig. 4 shows a machine for milling the joints of all kinds of cast butts. It is provided with a self-closing adjustable chuck, and over it is a horizontal steel spindle carrying a gang of adjustable mills. The chuck is fastened on an upright slide, which is raised and lowered by a rack and gear operated by a weighted lever, the extent of the upward motion being regulated by a set screw. The machine is designed to be attached to an ordinary bench, the spindle to run by a belt from an overhead counter-shaft. The operator stands in front of the machine and with one hand places one-half of the butt in the chuck and with the other releases the lever, which is held by a spring catch; the chuck then closes automatically, holding the butt firmly during the milling operation; when this is completed the operator lifts the lever into the spring catch and the chuck releases the butt. It is advantageous to have two machines, as one operator can run both, milling continuously and matching the butts as fast as done.

which "dead oil," creosote, or any other form of liquid fuel can be had is 1d. a gallon, and at this the supply is very limited. The specific gravity may be taken at not far from 0.9, so that a gallon of it would weigh about 9 pounds, but with coal at 0.05d. per pound we get 20 pounds for 1d., so that, again giving petroleum all the advantage of even numbers in lieu of fractions, it is just twice as dear as coal. To be burned, therefore, with equal economy, it must be twice as efficient; but a practical evaporation of 20 pounds of water per pound of petroleum has never been got. Indeed, this ratio is beyond the theoretical powers of the crude oil. It may therefore be taken as granted that liquid fuel has no claim to be a cheap fuel. At the price of even 3d. a gallon it could not be used at all for making steam, provided coal was accessible. Before proceeding to consider any other aspect of the matter it is well to finish with the question of relative economy. Petroleum is a very difficult thing to burn to advantage, because of the enormous quantity of smoke which it produces. The

could not keep steam to anything near the proper pressure, and the experiments made at Portsmouth have so far ended in the same way. We do not say that a special boiler may not be devised to get over the difficulty, but in any case it must be, we believe, much larger than the existing type.

A serious objection to the use of liquid fuel is that a very considerable quantity of steam is required to blow the fuel into the furnace. This steam acts on the fuel precisely as it would on water in an injector. It is condensed, and enters the furnace as so much water, which has to be all re-evaporated. It is true that it gives up its heat in the first instance to the fuel, but it makes no return whatever for the second evaporation, which is dead loss. If the steam were not made the second time its use for blowing in the fuel might in one sense be neglected, but with re-evaporation it stands for so much waste of heat. The quantity used has never been ascertained with any precision, but it is of importance. It renders the use of the supplementary feed necessary to keep up the level of the water



The Mason Pressure Regulator.

pipe marked "pressure inlet" in cut. To this diaphragm is attached a small auxiliary piston, which, with the variation of pressure, opens and shuts a small port, thereby admitting steam on the upper surface of a differential piston. The smaller and lower half of this piston constitutes the steam throttle, controlling the speed of the pump. When the pressure against which the pump is working exceeds the desired limit, the diaphragm is slightly raised (never over  $\frac{1}{4}$  inch), the port is opened, and the steam, acting upon the larger surface of the differential piston, closes the throttle. When the pressure falls below the desired limit the reverse action takes place and the pump "speeds up." The regulator is set to the desired pressure by simply turning the key shown at the top. The main points claimed for this regulator are its simplicity, ease of application and accuracy.

**Pressure on Bearing Surfaces.**

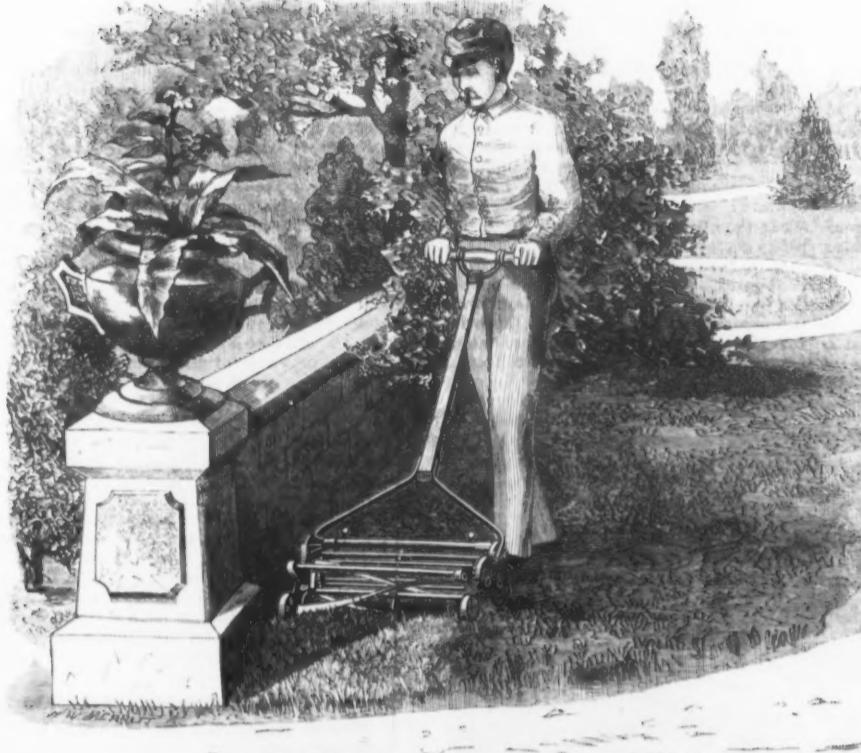
The pressure which may be permitted upon rubbing surfaces is determined by the velocity of rubbing, the character of the lubricant and the nature of the surfaces themselves. The two surfaces should usually differ, one being hard enough to bear the maximum pressure without change of form, and the other being less hard, in order that it may not abrade the first. With such an arrangement the surfaces, if properly cared for, take a fine, smooth, mirror-like polish and give a minimum frictional resistance. Cast iron surfaces, according to Thurston, unless very large, are less satisfactory than good wrought iron, and moderately hard steel is much better still. A pressure of 300 pounds to the square inch can rarely be attained on wrought iron at even low speeds, while a pressure of 1200 pounds is not infrequently adopted on the steel crank pins of steamboat engines. Pressures from 7000 to 9000 pounds per square inch have been reached on the slow working and rarely moved pivots of swing bridges. Pressures higher than from 600 to 1000 pounds per square inch on iron and on steel are to be avoided, and for general practice the pressure is less as the speed is greater, since the amount of heat developed is directly a measure of the amount of work done in overcoming friction, and is thus proportional to the speed as well as to the pressure.

The Edison Electric Illuminating Co., of New York, have increased their capital from \$1,000,000 to \$2,500,000.

# THE "NEW EASY" LAWN MOWER,

MANUFACTURED BY

## Blair Manufacturing Co., Springfield, Mass., U. S. A.



SPECIAL ADVANTAGE, No. 1.

The "NEW EASY" is the **only** Lawn Mower that will cut to within **one inch** of walls, fences, shrubbery, around trees, &c. (See above cut.)



SPECIAL ADVANTAGE, No. 3.

The "NEW EASY" is the **only** Lawn Mower with sufficient traction to cut high terraces with rope attachment. (See above cut.)



The "Bay State" Lawn Mower.

The Lightest and Quietest Running, Best Constructed, Handsomest and Most Durable Rear-Cut, Side-Wheel Mower Made!

Guaranteed first class in every respect, and superior to any other machine of this style in the market.

Four Sizes, 12 in., 14 in., 16 in., 18 in.

We also Manufacture the "BAY STATE" and "VICTOR" Lawn Mowers, herewith illustrated and described.

## To the Hardware

AND

Agricul'tl Implement  
Trade.

## Special Notice.

Do you want to handle the Lightest Running, Easiest Cutting, BEST SELLING Lawn Mower in the market? If you do, examine carefully the merits of the "NEW EASY," and you will know what Mower to buy. No Lawn Mower has yet been made that approaches so near to the ideal Machine for every kind and variety of work as the "NEW EASY." It stands pre-eminent and alone as the only perfect Mower manufactured, and combines the characteristic and exclusive advantages of the front-cut, traction-roller style of machine — viz., adaptability to every grade of lawn work, with extreme ease of operation.



SPECIAL ADVANTAGE, No. 2.

The "NEW EASY" is the **only** Lawn Mower that will run off its level and cut low terraces, mounds, flower beds, &c. (See above cut.)

Herewith are illustrated a few of the special uses to which the "NEW EASY" is adapted, and that are not possessed or claimed for any other Mower, while for general purpose work it is Chief of the best.

Notice the "New Easy" Lawn Mower  
and What We Claim for It.

We do not advertise the "NEW EASY" as a Field Mower, nor assert that it will cut grass 12 inches high with perfect ease; but for a Lawn Mower, Strong, Durable, Easily Sharpened and Adjusted, of Varied Capacity, Graceful Form, Long and Pleasing Service, and so easily operated that a lady or child may use it without fatigue, we do claim that the "NEW EASY" to be without a rival; and our Agents are authorized to sell this Mower with the express guarantee that these claims shall be verified by trial.



SPECIAL ADVANTAGE, No. 4.

The "NEW EASY" is the **only** Lawn Mower that will cut **narrow borders**. (See above cut.)

*Every Mower unconditionally warranted. Made in Seven Sizes. 10 in. to 24 in.  
All for hand use.*

*Catalogues and Price Lists of our Lawn Mowers, with discounts to the Trade,  
furnished on application to any of the following*

## WHOLESALE AGENTS:

Louderback, Gilbert & Co., N. Y. City.  
Parker & Wood, Boston, Mass.  
L. M. Rumsey Mfg. Co., St. Louis, Mo.  
Charles M. Ghriskey, Philadelphia, Pa.  
E. S. Bristol & Gale, Chicago, Ill.  
Samuel G. B. Cook & Co., Baltimore, Md.  
Rice, Born & Co., New Orleans, La.  
Buhl, Sons & Co., Detroit, Mich.  
B. L. Bragg & Co., Springfield, Mass.  
George B. Bahr & Co., Louisville, Ky.  
Scobie & Parker, Pittsburgh, Pa.  
Baker & Hamilton, San Francisco, Cal.  
Baker & Hamilton, Sacramento, Cal.  
T. A. Pickering, Cincinnati, Ohio.  
George Worthington & Co., Cleveland, Ohio.  
Bostwick, Braun & Co., Toledo, Ohio.  
John Patterson, Columbus, Ohio.  
George W. Rouse & Son, Peoria, Ill.  
Stewart & Montgomery, Rock Island, Ill.  
A. D. Perry & Co., Syracuse, N. Y.  
Corning & Co., Albany, N. Y.  
Howe & Co., Troy, N. Y.  
Shaughnessy Bros., Utica, N. Y.  
C. A. Cary & Co., Rochester, N. Y.  
Pardoe & Co., Rochester, N. Y.  
Chaffee & Vertrees, Des Moines, Iowa.

E. D. Carter, Erie, Pa.  
Lindsay Brothers, Milwaukee, Wis.  
Hildebrand & Fugate, Indianapolis, Ind.  
Farwell, Ozmun & Jackson, St. Paul, Minn.  
Northrup, Braslan & Co., Minneapolis, Minn.  
W. P. Bissell & Co., Davenport, Iowa.  
Gardner & Co., Kansas City, Mo.  
A. J. Harwi, Atchison, Kan.  
R. G. Craig & Co., Memphis, Tenn. [Tenn.  
Howard, Ewing & Craigmiles, Chattanooga, Tenn.  
W. W. Woodruff & Co., Knoxville, Tenn.  
R. F. Adams & Co., Nashville, Tenn.  
Horsley & Burk, Galveston, Texas.  
Noland & McRosky Hdw. Co., Dallas, Texas.  
W. F. Lake, Fort Worth, Texas.  
Lewis & Scott, Denver, Col.  
Low & Clasbey, Salt Lake City, Utah.  
John Agnew, Columbia, S. C.  
Gilmour & Co., Montreal, for Canada.  
Markt & Co., New York, London and Hamburg, for Great Britain and the Continent of Europe.  
Henry W. Peabody & Co., Boston and New York, for Australia and New Zealand.

THE  
"Victor" LAWN MOWER

In the growing demand for a good, durable Mower at a low price. The "Victor" is a center cut machine, provided with extra large driving wheels, and a noiseless and durable ratchet. The knives are made of the best quality cast steel, and the whole Mower is constructed in a strong, substantial manner, and is offered to the Trade as the best Mower for the price the market affords.

Three Sizes. 12 in., 14 in., 16 in.

According to the most recent coal trade, cause of an increase in all coal, adjustment of weight, this makes each hand if not too often some or to escape shipper, miner's reflecting by both correct refusal settlement leave him responsible who is coal at his customer destination finds the short of notices allowance shortage to the mine was shipment, when settling the mine's household evidence in transit, there can cause of section, and stealing remedied only, and in a given must need in the process. In our just one losses. The miner, performing handling then that others in another a No reason the ridiculous parties to the others predicament in by reason to miners to all who thought they are equally likely medium or the other question conform to that harm of interest trade can

TRADE  
Well-Drill

Messrs. have sent well-drilling embraces tractions out by them also gi

Bolle  
An attractive Bigelow turns particular machinery and station and water-plate-iron attention obliged, by work, to enter their form profusely il

Messrs. I. E. villa, Ind., giving full new Acme special value workers, because require moderate price. Cortlandt agents.

In the coming England R. attention that is the crack if he supported by count of sons on the subject of Ots from each physical to boiler steel straightened red, plunged

### The Responsibility for Shrinkage In Car Coal Shipments.

According to the *Black Diamond*, one of the most perplexing problems of the car coal trade, and one which requires the exercise of an unusual degree of patience and an intelligent appreciation of the rights of all concerned in the solving of it, is the adjustment of claims for shrinkage or short weight. In the adjustment of claims of this nature miners, shippers and dealers each have rights that the others are morally, if not legally, bound to respect; yet it is too often the case that injustice results to some one of them through the anxiety of all to escape responsibility. The position of the shipper or jobber is probably the most untenable, for he it is that must stand between miner and dealer and harmonize their conflicting claims—if he can. The assumption by both miners and dealers of the infallible correctness of their respective weights, and refusal of each to recognize, as a basis of settlement, other than their own weights, leave him no alternative but to accept responsibility for the loss. To illustrate: B, who is a shipper, purchases a quantity of coal at the mines and orders it shipped to his customer, C. Upon arrival of cars at destination C has the coal weighed out and finds the quantity received several tons short of mine weight, and he immediately notifies B of this fact and requests that an allowance be placed to his credit for the shortage. B reports the claim of shrinkage to the mines, and is promptly informed the coal was correctly weighed at the point of shipment and that mine weights must govern settlements. C, being duly informed of the mines' *ultimatum*, notifies B that he will not pay for coal he did not receive, and withholds payment for the shortage claimed.

The foregoing illustrates briefly the practical results of most claims for short weight, and, even though the monotony of such claims (and they are numerous and increasing rapidly) is sometimes broken by various complications, the results are almost invariably the same. The shipper may attempt to locate the loss and fasten it upon some one of the railroads over which the coal was transported, but this is as tedious a process as it is useless, and one might as well seek for a needle in a haystack as to trace for evidence fixing responsibility for loss of coal, in transit, upon any railroad company. Yet there can be little doubt but that the main cause of shrinkage is loss during transportation, and principally from transfers and steaming; but these abuses are not easily remedied, and, being matters of conjecture only, and not susceptible of positive proof in a given case, railroad transportation must necessarily be eliminated as a factor in the problem of short-weight settlements. In our judgment, it seems plain that there is only one way of equitably adjusting these losses. The measure of responsibility for miner, shipper and dealer is the faithful performance of his respective duties in the handling of each car of coal. Assuming, then, that each fulfills his obligations to the others in this respect, should one more than another assume the risks of transportation? No reasonable person will for a moment take the ridiculous position that, of three guiltless parties to a bad contract, one more than the others should suffer; yet this is just the predicament the shipper often finds himself in by reason of the unjust position assumed by miners and dealers. It must be apparent to all who have given the subject any thought that miners, shippers and dealers are equally innocent of blame in the premises; why, then, should they not share equally losses arising from an imperfect medium of delivery of coal from the one to the other? No other solution to this vexed question seems practicable, and until all conform to the plan of pro rata settlements that harmony and good-feeling, that identity of interests, so essential to the success of the trade cannot prevail.

### TRADE PUBLICATIONS.

#### Well-Drilling and Prospecting Machinery.

Messrs. Loomis & Nyman, of Tiffin, Ohio, have sent us an interesting catalogue on well-drilling and prospecting machinery. It embraces 64 pages and is replete with illustrations of the different appliances turned out by them. Price lists and tables of sizes are also given.

#### Boilers and Steam Engines.

An attractive catalogue recently issued by the Bigelow Co., of New Haven, Conn., contains particulars of a large variety of machinery turned out by them, such as portable and stationary boilers and engines, hydrants and water-gates, foundry cupolas, tanks and plate-iron work, &c. The company direct attention to the fact that they have been obliged, by the increased demand for their work, to enlarge their facilities to fully twice their former capacity. The catalogue is profusely illustrated.

#### Blowers.

Messrs. P. H. & F. M. Roots, of Connersville, Ind., have issued a neat catalogue giving full information concerning their new Acme hand-blower. This device is of special value to blacksmiths and metal-workers, being in every way adapted to the requirements of the smith's forge, at a moderate price. Messrs. Cooke & Co., of 22 Cortlandt street, New York, are the selling agents.

In the course of a discussion at the New England Railroad Club Mr. Coleman called attention to a curious property of steel, and that is when slightly heated it would crack if bent, and in this he was in turn supported by Mr. Lauder, who gave an account of some experiments that he had made on the subject. He took two pieces of steel, one of Otin and one of Benzon, cut strips from each and subjected them to all of the physical tests usually employed in testing boiler steel. He bent them double cold, straightened them out, heated to a cherry red, plunged into cold water and bent

double without their showing the slightest sign of fracture. Then taking strips from the same pieces he heated them, after brightening over a piece of hot iron, to the point where the blue just begins to show, and on bending them both showed a wide fracture long before they come down flat.

#### Rotary Engines with Movable Partition.

Continuing the subject of rotary engines, the London *Engineer*, from whom we have quoted on several occasions, supplies the following under the above head:

Rotary engines of this character are very numerous, and seem at first sight to offer the solution of the problem of producing a direct turning movement of a shaft by the action of steam or other pressed fluid. An engine of this character was devised by Watt, a contrivance which consisted of a radial piston attached to the revolving shaft, and which was made to extend the whole length of a cylinder and revolve within it, its outer edge touching against the barrel of the cylinder. To obtain a steady piece against which the steam might react in its effort against the piston a partition piece was introduced of such a character as to revolve about a longitudinal axis in the cylinder barrel, so as to allow the piston to pass freely when coming up to it, but so arranged as to drop down with its edge against the revolving shaft after the piston had passed. An engine on similar principles has been invented by Mr. John Pinchbeck. The broad character of the Pinchbeck engine is not unfamiliar, but the in-

vention a perforation is made from the hollow of C, leading into the left-hand chamber. When the block B is at its highest point, the eccentric arm of A being vertically upward, the steam is on the point of entering, as at this time the blanks between the channels of C are about to cease blocking the channels of the arrow. The steam on the other side exhausts freely through E. As the revolution continues the ports open wider and wider, until the shaft has turned through 45°, after which it begins to close, contracting gradually until the angle becomes 90°, when they close entirely and are situated as shown in Fig. 1. The remaining half of the revolution is obtained by the expansive action of the steam, the ports during this period remaining closed.

If a single engine were employed the momentum of the machinery would have to carry the revolving cylinder past its upper vertical position, as in this position the chamber is not divided by the partition. The peculiarity of this engine lies, however, in the use of two cylinders, not so much to avoid dead points as to obtain a mutual action between the reciprocating blocks. The second cylinder and its mechanism are so disposed that the upward movement of the block in the one engine carries out the downward movement of the block in the other, a suitable lever connection being employed. This second engine and the arrangement of its parts can be seen from the longitudinal section, Fig. 2; the fittings are the same as in the other, but so placed

revolving shaft square, the shaft being forged square and passed into a square hole in the cylinder. A little play being purposely allowed, set-screws are so placed as to set the revolving cylinder outward against the fixed. A fair surface contact is obtained here because of the similar curvature. For the sides of this piece metallic rings m are fitted in annular grooves running around the ends as near to the outer edge as possible, and kept against the sides of the fixed cylinder, as with the packing of an ordinary piston. To prevent dirt obtaining access to the working parts the upper part of the machine is closed by a light cover. An engine of this description with 8-inch cylinders will develop a brake horse-power of about 5, running at 450 revolutions, with a steam pressure of 45 pounds on the square inch. With duplicate valve gearing and duplicate steam and exhaust channels this engine can be made reversible.

The Bennison engine, which is manufactured by the same firm as the previous engine, Messrs. R. Waygood & Co., may be said to be in some respects the converse of the Pinchbeck engine. In the Pinchbeck engine the sliding partition is moved in a fixed frame by the revolution of an eccentric cylinder; in the Bennison the sliding partition is moved in a revolving frame by the action of a fixed eccentric piece. The simple movements of this engine can be seen from Fig. 3. A fixed cylinder is so shaped that a radial partition, A, while revolving about its axis, is compelled to take an eccentric course. To accomplish this completely the inner fixed cylinder is shaped so as to have a similar eccentricity with the outer, there being a constant radial distance between them. Turning on this central cylinder is a cylindrical piece, B, whose outer surface touches that part of the outer cylinder which penetrates farthest into the interior. The piece A is paired with piece B by means of a longitudinal slot in B, to allow of A sliding in and out as it is acted upon by the fixed eccentric surfaces. This formation extends the whole length of the cylinder. Upon turning the shaft B the chamber between one side of the partition A and the fixed eccentric abutment from the large cylinder increases, that on the other decreasing. Suitable steam and exhaust channels being provided at S and E, one chamber is expanded by the action of the steam, the other being opened out to exhaust, the consequence being that the piece A is forced round, carrying with it the shaft piece B. As A comes up on the other side of the eccentric abutments it sinks back into B, reappearing as it comes out on the other side; the above action is then repeated and continuous rotation kept up. The actual Bennison engine differs from this in having four rotating sliding blocks, two opposite eccentric abutments on the same cylinder, and in having the steam and exhaust passages so dis-

through two quarters of the cylinder in a revolution, the aggregate volume swept through is evidently twice that of the cylinder. This engine is as much used as a pump as a motor, a 14-inch pump delivering over 1000 gallons of water while running at 200 revolutions per minute, and this water delivered, as might be deduced from the examination of its construction, in a steady stream.

#### Continental Statisticians on the Decline of British Trade.

Continental statisticians have recently been engaged in compiling an array of figures going to show that of late years British foreign and colonial trade has declined, while that of the Continent has been gaining. Some of the statistics from which they draw their conclusions may be briefly noticed. British import amounted in November last to £20,883,763, being £80,635 less than in November, 1864; the export was £16,464,250, or £1,239,063 less. The decrease of import during the 11 months of the year was £13,998,853, and of export £19,260,493. The share of Great Britain in the world's trade as compared with that of other countries underwent, according to the statistics from which we quote, the following changes:

	Great Britain.	All other countries.
1868.	24%	76%
1875.	21%	78%
1882.	19½%	80½%

European foreign trade alone :

	Great Britain.	Continent of Europe.
1868.	31½%	68½%
1875.	33 1-10%	66 10%
1882.	29%	71%

So far as English returns show, the decline of foreign and colonial trade has made further progress during the past three years, but from different causes. While the decline between 1875 and 1882 was chiefly due to Germany, France, Austria, Russia and Italy adopting protective tariffs, and to a considerable extent shutting out British goods, the decline since 1882 has arisen mainly from general stagnation in trade all over the world, in consequence of the depreciation of raw material, crippling the purchasing capabilities of the tropical countries in particular—we mean the decline in sugar, coffee, indiarubber, hemp and cotton. All countries exporting manufactured goods to those countries have seen their trade decline, England, the Continent and the United States alike. Besides, if England's import figures have gone on declining of late years, this has been due in a great measure to the greater cheapness of the articles named and of other raw material, as well as of half-manufactures and manufactures.

We fear that Continental statistics based entirely on values are calculated to mislead. Too much dependence should not be placed on them, especially when applied to a country doing the enormous business England transacts all over the globe. If statistics were carefully prepared based on the weight of goods instead of on the value, or on both together, it would, we think, be seen that England's decline in foreign and colonial trade as compared with that of the Continent is not quite so bad as the French and other economists would make it. Besides, between 1868 and 1882 the world's trade increased 50 per cent., and it was hardly to be expected, in this great development, that England's percentage of the total trade would be as large at the end of the period named as at the beginning. The change in Continental fiscal policy undoubtedly curtailed English export in that direction, but, as we have shown in our articles on Indian and Australian trade, both the import and export to and from those colonies and England have been steadily on the increase. Long before 1879 English manufacturers were aware that the industrial advancement on the Continent would by degrees cause that market to become less valuable to them, that both coal and pig-iron production especially would go on increasing abroad, and that in these two items at least English supremacy would thenceforth be on the wane. A few figures will show this decline :

	Coal Production.	Other countries.
1868.	53.9%	46.4%
1875.	47.5%	52.6%
1882.	41.6%	58.4%
1883.	40.7%	59.3%

Pig-Iron Production.

	England.	Other countries.
1868.	44.1%	55.9%
1875.	45.5%	51.1%
1882.	39.6%	60.1%
1883.	39.1%	60.9%

But this does not imply that what was produced in England was on that account any less profitable during the interval.

That cotton industry on the Continent should gradually reach large proportions was natural, and in this item, too, England has lost much of her European supremacy, as the following figures show :

	Cotton Consumed in Europe.
England.	60.3%
On Continent.	39.7%
1868.	59.5%
1875.	41.7%
1883.	47.7%

But even in this branch of industry it is by no means proven that the profits accruing were any less in England during the interval.

If trade and industry have been dull in England for a year or two past, they have also been dull on the Continent and in this country, and the figures which Continental statisticians produce do not in the least convince us that there is decadence of an alarming, and possibly lasting, nature in British foreign and colonial trade. We may well believe that British manufacturers and merchants are alive to the conditions of the present time, and, though conservative, are not slow to take advantage of any trade opening that may offer. The fact is Continental nations have neither the money, nor the credit, nor the connections, to oust Great Britain from her position as the leading commercial nation, and we think it will be many years before they are in a position to seriously cripple her trade, unless British statesmen should involve her in disastrous wars with first-class maritime powers.

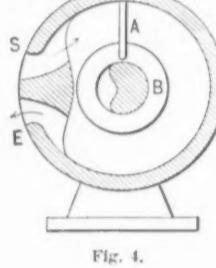


Fig. 4.

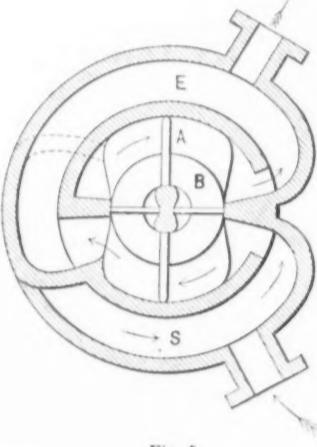


Fig. 5.

Bennison's Engine,

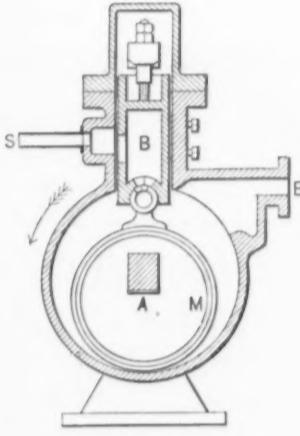


Fig. 1.



Fig. 3.

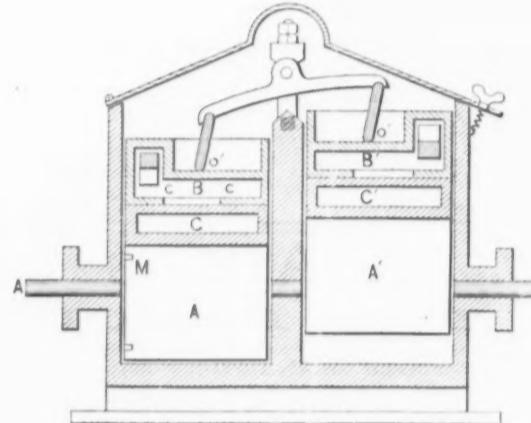


Fig. 2.

Sections of the Pinchbeck Engine.

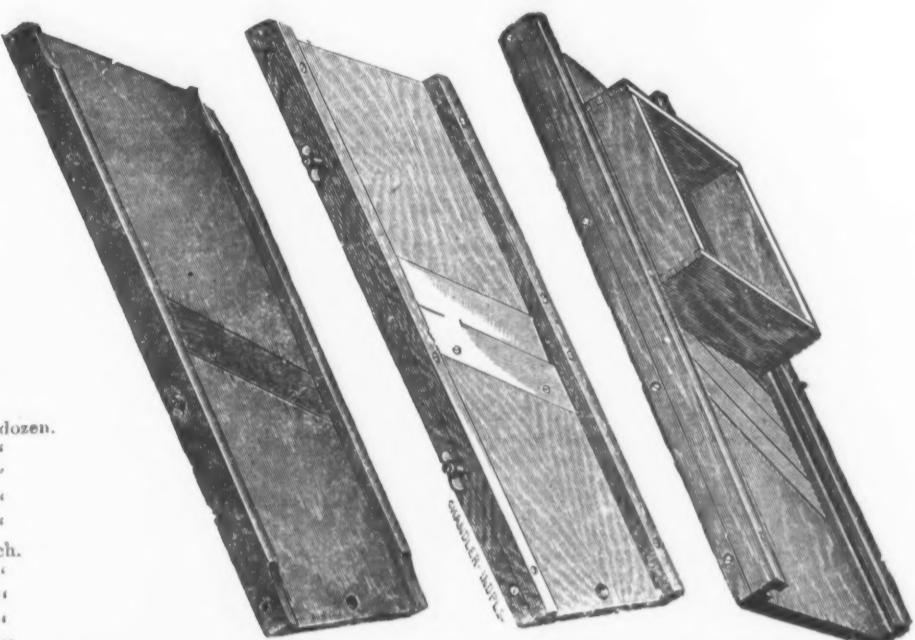
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INDIANAPOLIS, INDIANA.



## KRAUT CUTTERS.

No 1 .....	1 knife, with box, 8 x 26, per dozen.
" 2 .....	2 knives, " " "
" 3 .....	3 " " "
" 4 .....	4 " " "
" 5 .....	5 " " 9 x 30, "
" 6 .....	6 " " 12 x 36 each.
" 7 .....	7 " " "
" 8 .....	8 " " "
" 9 .....	9 " " 12 x 40, "
" 10 .....	10 " " "



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Has No Equal,  
Surpassing All Others,  
AND PRONOUNCED

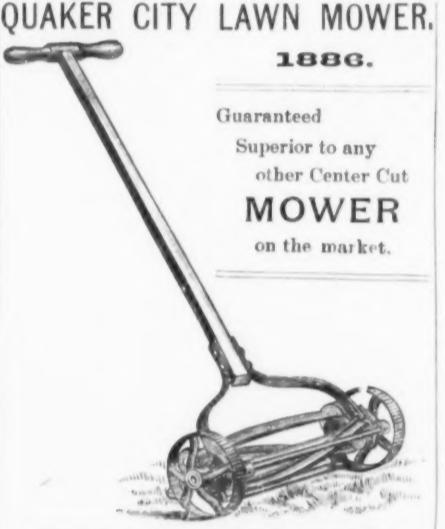
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GODFREY, HORN & CO., Denver, Col.  
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WM. FRANKFURT & CO., Milwaukee, Wis.  
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Guaranteed  
Superior to any  
other Center Cut  
**MOWER**  
on the market.

THE QUAKER CITY  
Reduced in Price.  
NOW, WHY BUY A WORTHLESS MOWER?

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Cutting Bar in the rear adapting  
itself to all unevenness  
of the ground.

## CONTINENTAL LAWN MOWER CO., PHILADA.

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NEWLIN, KNIGHT & CO., Philadelphia.  
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MOORE, FLEMING & CO., St. Louis, Mo.  
BOETTCHER HARDWARE CO., Denver, Colo.  
DUNHAM, CARRIGAN & CO., San Francisco, Calif.  
BIGELOW & DOWSE, Boston, Mass.  
STEEL & AVERY, Rochester, N. Y.  
CLARK, QUIEN & MORSE, Peoria, Ill.  
RUSHER & BILLINGSLEY, Minneapolis, Minn.

WOLFF, LANE & CO., Pittsburgh, Pa.  
GEO. WORTHINGTON & CO., Cleveland, Ohio.  
MOORE, FLEMING & CO., St. Louis, Mo.  
BOETTCHER HARDWARE CO., Denver, Colo.  
DUNHAM, CARRIGAN & CO., San Francisco, Calif.  
BIGELOW & DOWSE, Boston, Mass.  
STEEL & AVERY, Rochester, N. Y.  
CLARK, QUIEN & MORSE, Peoria, Ill.  
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## E. C. Atkins & Co., Indianapolis, Indiana.

### THE FAMOUS "DEXTER."

Second only to the Silver Steel Diamond, and equal to it when made of the same class of steel, is the Patent Concaved Tooth Dexter. The patent by which this saw is protected consists of a depression of the face of the cutting teeth through the centre from point to base, thus removing all friction while in use, giving strength and stiffness to the teeth and increasing threefold the durability of the "set." This saw never fails to give the best satisfaction.

E. C. ATKINS & CO.,  
INDIANAPOLIS, IND.  
TRADE MARK

PAT. CONCAVED TOOTH DEXTER  
CAST STEEL WARRANTED.

Ground substantially uniform gauge on the toothed edge and any gauge required on the back.

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The above cut represents one design of our new Hollow Handle Knife, either silver or nickel silver handles, made of a seamless drawn tube. This handle is not soldered, as is the usual method, and yet has the taper and form necessary to produce the most durable and tasteful article of its kind ever shown. Knives can be furnished either plain or ornamented handles.

R. WALLACE & SONS MANUFACTURING COMPANY,  
MANUFACTURERS OF SOLID SILVER WARE GUARANTEED 100% FINE, ALSO NICKEL SILVER HOTEL AND TABLE WARE,  
Factories, WALLINGFORD, CONN.

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The lightest  
running, best and  
cheapest Lawn Mower  
in the Market.  
10, 12, 14 and 16 inch cut.

Also Manufacturers of the  
Buckeye Hose Reel and Lawn  
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Every Pair Warranted  
for One Year and  
No Rattle.

Send for Circular to  
STILES FROST,  
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The ACME SHEAR CO.,  
Bridgeport, Conn., U. S. A.,  
Manufacturers of  
**CAST SHEARS**.  
The Best and Cheapest in the market. Lamp Trim  
mers, Lemon Squeezers, Ice Picks and Tongue, Nut  
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Frost's Pat. Thill Spring  
Anti-Rattle.  
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SCREW DRIVERS  
OF ALL KINDS  
A SPECIALTY.  
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#### "THE NEW LITTLE GIANT SCREW PLATES."



Our No. 5 cuts  $\frac{1}{4}$ ,  $\frac{5}{16}$ ,  $\frac{13}{16}$ ,  $\frac{7}{16}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$  inch,  
And We Sell it for SIXTEEN DOLLARS.

This cut shows our  
NEW  
ADJUSTABLE  
DIE.

To adjust, simply turn Screws at ends of Dies.

THE STRONGEST,  
THE SIMPLEST,

THE BEST

Don't fail to ask your Dealer for "The New Little Giant."

### BUFFALO SCALE CO.,

BUFFALO, N. Y.,

Manufacturers of

R. R. Track Scales, Hay Scales, Coal  
Scales, Grain Scales, Platform  
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Send for price list, stating what you want.

### SCREW DRIVERS OF ALL KINDS A SPECIALTY.

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THE ELLRICH HARDWARE MANUF'G CO.,  
HARDWARE SPECIALTIES,  
Plantsville, Conn.

### MINERAL WOOL

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#### An Indestructible Material.

The BEST and CHEAPEST material  
known for

INSULATION OF HEAT.

PROTECTION AGAINST FROST.

PREVENTION OF SPREAD OF FIRE.

FREEDOM FROM RATS, MICE & INSECTS

DEADENING OF SOUND.

Used in buildings. It keeps the TEMPERATURE UNIFORM, SAVES largely in the EXPENSE of heating, renders the walls and floors exempt from the CONDUCTING OF SOUND. Completely NON-COMBUSTIBLE. IT IS VERY VALUABLE FOR FIRE-PROOFING.

AS A IRON-COVERED WIRE ROPE, AS A STORM

Pipe, Boat Domes, Hot Air and Blast Pipes, and

all heated surfaces, and as a Protection against Frost for Waste Pipes.

Mineral Wool is Invaluable.

Over Ten Million Pounds in Use.

For Samples, Information and Prices, address

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CLINE'S PORTABLE

FOOT HEATER AND FUEL,

Especially adapted for SLEIGHS, CARRIAGES, CABS,

BUGGIES, & LIGHT WAGONS. Also for OFFICE and

RESIDENCE USE. SELLS AT SIGHT. For prices to

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CLINE MANUF'G CO.,

334 State Street, CHICAGO.

"No smoke, no smell, no blaze, no danger."

Samuel Martin,

MANUFACTURER OF

Theatrical Hardware,

127 Eighth Avenue, New York.

## THE WEEK.

Natural gas is now being successfully utilized as a street cleaner. At Beaver Falls, Pa., a hose with perforated metallic nozzle was attached to the main, the gas was ignited, and the mountains of snow that blocked the street were reduced to water in a few minutes by a powerful stream of hissing blue fire. Pittsburgh people are now talking of applying the same system on an extensive scale.

The Board of Supervising Inspectors of Steam Vessels, in session at Washington, unanimously voted in favor of the repeal of the last paragraph of Section 14, Rule 2, relating to the use of upright tubular boilers, which was adopted at the last annual meeting of the Board.

There are now in the Southern States 139 cotton-seed mills. In 1866 there was not one.

At the annual meeting of the Portland, Me., Board of Trade, the secretary's report showed that the European trade through that port is now steadily improving and will probably reach \$12,000,000 in value the present year.

The Treasury Department is in receipt of information that the Government of the Netherlands is considering a proposition to assess a duty on petroleum and ship timber, articles which have hitherto been on the free list. This action, it is intimated, is intended to be in the nature of a retaliatory measure against the United States on account of its alleged discrimination against the importation of Sumatra tobacco into this country. It is likely that the matter will be brought to the attention of the House Committee on Ways and Means.

Tiffany & Co. some time ago imported a lot of bronze statuettes and Collector Hedges collected 45 per cent. duty on them, claiming that they were manufactured bronze. The firm claimed that they were the work of professional artists and could only be subjected to 10 per cent. duty. Judge Shipman, in the United States District Court, recently gave a verdict in favor of the importers.

The proposed addition to the Museum of Natural History in Central Park will cost \$325,000.

The Misses Drexel, who inherited from their father, the late F. A. Drexel, of Philadelphia, a fortune of \$12,000,000, have just purchased 200 acres of land near Bristol, Pa., on which they will establish an industrial school and home for orphan boys.

The value of manufactures in San Francisco for the year 1885 is estimated at not less than \$90,000,000, against nearly \$78,000,000 in 1880, as shown by the census, or nearly three-fold that of 1870. Foundry-work and whale oil refining are among the latest additions to local industry.

The National Board of Trade convened in Washington City on the 20th inst., Frederick Fralay, of Philadelphia, presiding, and after discussion resolutions were adopted by a vote of 32 to 10 declaring "the necessity of adopting the same methods pursued by our competitors to establish quick and frequent communication with foreign markets, and place our shipowners upon an equal footing with those of other countries; also that it is expedient for the National Government to assume the full expenditure authorized by law for the carriage of the mails to foreign ports in American vessels." Senator Dolph took occasion to make an attack upon the Beck Free Ship bill by saying that, while he desired to see the American flag upon every sea and at every port in the world, he only wished to see it flying from vessels built in the United States and representing American capital, enterprise and industry.

The New York State Comptroller submits his report for 1885, showing that the surplus September 30 was \$2,711,144, exceeding the estimate, but this surplus has not been actually collected, and the condition of the treasury is not altogether satisfactory. The Legislature is warned of the necessity of more regard for the finances. The tax rate for the current year is 2 $\frac{1}{2}$  mills, which, upon the present valuation of \$3,094,731,457, will produce \$9,160,405.11. The receipts from corporation tax for the last year were estimated in the report for 1885 at \$1,600,000. The actual receipts were \$1,673,879.09.

A dispatch from London says that at the instance of England the six great powers have notified Greece that a naval attack by Greece upon Turkey will not be permitted, and the admiral of the Mediterranean fleet has been ordered to take action should Greece disobey the powers.

The report of the New York Fire Commissioners shows that there were 2479 fires last year, which caused an aggregate loss of \$37,789,283. The number of new buildings erected, planned or begun was 3368; their estimated cost was \$45,374,013. There were 250 buildings altered at an expense of \$7,594,825. The number of buildings completed was 2882. The recent census shows that there are 104,012 buildings exclusive of sheds in the city. There are 14,199 buildings over four stories high, and 522 fire-proof buildings.

Circulars have been sent to Washington by some of the leading railroads of the Northwest urging a reduction in the tariff

on steel rails. The circulars claim that the railroads are entitled to as much protection from the Government as the rolling mills, and states that few of the railroads can do more than to pay fixed charges and reasonable interest.

The American Society of Civil Engineers number 928 members. At the annual meeting held on the 21st inst., the following officers were elected: President, Henry Flail, of St. Louis; vice presidents, Thomas C. Keefer, of Ottawa, Canada, and Thomas F. Rowland, of New York; secretary and librarian, John Bogart, of New York; treasurer, James R. Cross, of New York; directors, George S. Green, Jr., William R. Hutton and W. Howard White, of New York; Henry G. Morris, of Philadelphia, and Charles L. Strobel, of Chicago. Elliott C. Clark, of Boston, won the Norman medal for the best paper on any engineering subject submitted during the year, and A. M. Wellington, of the *Railroad Gazette*, was awarded the Rowland prize for the second best.

The tramp steamer Hylton Castle, of England, from New York to Rouen with a cargo of grain, foundered off Fire Island. An iron plate in her hull is supposed to have given way under the buffeting of heavy seas.

The most recent estimate that has been made by the French engineers in regard to the proposed African inland sea is that the undertaking could be consummated in the maximum period of five years at a cost of about \$30,000,000, it being sufficient to cut, in the alluvial part of the region traversed, a canal averaging some 80 to 100 feet in width, which would be further widened by the action of the current.

The efficacy of iron bulkheads in steamships was strikingly shown in the case of the steamer Crystal, bound from Newcastle to New York, which was 10 days at sea with fire in her main hold. By closing every aperture which could admit air to the cargo the steamer was kept afloat until fireboats came to her relief in New York harbor. The damage was about \$10,000.

Of no less than eight bills now before Congress in some way closely related to the shipping interests of the United States it is remarked that but one of them, which approves in substance of the French bounty scheme, has received the formal endorsement of the New York Maritime Association. This alone in their judgment apparently giving promise of adequate relief.

The annual report of the Reading Railway Co. shows that the net earnings for 1884-85 were \$12,652,249; deficit in earnings of the Coal and Iron Co., \$12,679; for both companies, net earnings, \$12,527,569. The deficit in the operations of the New Jersey Central Railroad was \$1,338,377.

Manufacturers are locating in New York in larger numbers, attracted by the facilities for doing business and the advantages of direct transportation to various markets. Park Commissioner Crimmins says: "The great point, they tell me, is that they can get better rates from here and can have better and more direct communication with their customers from this great center than elsewhere."

The New York Steam Co. have offered the use of its mains and pipes to the City free of cost to convey steam or water through in case of fire. The company "agree to put in place in the dry-goods district all necessary mains, with provision for service laterals, to enable steam or water at will to be delivered in sufficient supply for all possible demand for fire or other purposes."

The Delaware Ship and Engine Building Co., of Chester, Pa., are laying the keel for an iron steamship for the United States and Brazil Mail Steamship Co. She will be 324 feet long over all, 42 feet beam, and 24 $\frac{1}{2}$  feet depth of hold from the top of ceiling to main deck, being designed for large cargo capacity. Her engine will be 38 x 74 and 54-inch stroke, developing between 2100 and 2300 horse-power, which will drive her at a high rate of speed. She will have a cut-off on high and low pressure cylinders. The Alliance, as she will be called, is the first of three new steamers to form a direct line from New York to Buenos Ayres via Rio de Janeiro, and will be placed on the route next fall.

The supervising inspectors of steam vessels organized as a board form an inspecting body, about one-half of whom are engineers and machinists and the rest masters and pilots, as follows: President, Jas. A. Dumont, Washington, D. C.; Chas. C. Bemis, San Francisco, Cal.; Geo. H. Starbuck, New York, N. Y.; James Curran, Baltimore, Md.; David R. Asbury, St. Louis, Mo.; George Hays, St. Paul, Minn.; Irwin Dugan, Louisville, Ky.; Americus Warden, Cincinnati, Ohio; Wm. M. Daly Detroit, Mich.; Wm. D. Robinson, Buffalo, N. Y.; Matt O'Brien, New Orleans, La.

In 1879 and 1880 the City imposed taxes upon the New York and Harlem Railroad Co. upon a valuation of \$3,000,000 for the tunnel, tracks, roadbed and masonry under Fourth avenue between Forty-fifth street and the Harlem River. The Supreme Court in an appeal against the tax commissioners decided that the company was only liable to taxation upon the railroad structure, consisting of the roadbed, rails and station-houses. A further appeal was taken by the

City to the Court of Appeals, upon which a decision was announced this week sustaining the action of the commissioners and reversing the decision of the General Term. The tax imposed upon the tunnel from Thirty-fourth to Forty-second streets was also sustained by the court. The result of the decision is to authorize the City to impose taxes upon the railroad company for the value of the several structures.

During last year 3451 buildings were erected in St. Paul, valued at \$7,234,834. In Minneapolis 3370 buildings were erected, valued at \$9,075,000. These figures are from a Minneapolis paper, and may be colored by municipal jealousy.

At Youngstown, Ohio, an explosion of melted metal in the mills of Brown, Bonnell & Co. scattered debris in every direction and hurled iron through the roof. Several workmen were injured.

The annual report of the New York Railroad Commission for the year ending September 30 last shows that an enormous business was done notwithstanding the unprofitable rates, the gross earnings being \$111,632,961.47, as against \$120,227,871.72 the year before. The operating expenses were about \$6,000,000 less than in 1884. The report says: "Probably for the first time since railroads have been run within the State of New York can it be said that a year has elapsed without a single passenger being killed from causes beyond his own control. Such was the fact for the fiscal year ending September 30, 1885." Thirty-nine drunken persons were killed.

The Clyde statistics for 1885 tell the story of the gain made by steel on iron during the year. Of all the tonnage constructed and launched on the river last year steel showed a percentage of 48. No further back than 1879 the percentage of steel tonnage produced on the Clyde was only 10%. The North German Lloyd now has three new steamers under headway at Govan, near Glasgow, and the Havre line gives its orders for four more vessels of steel to the St. Nazaire shipyard in France, all of which will be splendid additions to the steel fleet already in existence.

The Union Ferry Co.'s franchises are to be sold at public auction, by order of the Sinking Fund Commissioners. The upset price will be 11 $\frac{1}{2}$  per cent. of the gross earnings.

Resolutions appealing to Congress against the construction of the proposed bridge across Staten Island Sound were introduced into the New Jersey Legislature on Monday and referred to the Commission of Riparian Rights by a vote of 35 to 20.

Lord Salisbury has consented to recognize China as nominal suzerain over Burmah on the condition that the Pekin Government abandons its claim to tribute from Burmah and open the Chinese frontier to British traders at 5 per cent. ad valorem duties, except on opium.

James B. Colgate, bullion dealer, of Wall street, has been adjudged by Judge Van Hoosen a general partner in the insolvent firm of H. Humphrey, and a judgment for \$82,203.94 directed against him in the suit of the Manhattan Co.

The suit of Frothingham and others against Jacob Sharp and his associates of the Broadway Railroad Co. to compel an accounting for the \$2,500,000 mortgage, the proceeds of which are supposed to have been used in buying the Legislature and the Aldermen, came up before Judge Van Brunt, and is likely to be pushed with vigor.

A new car heater, by which street cars are said to be heated at a cost of between 25 and 35 cents for 24 hours, was experimented with in Chicago a day or two ago. The apparatus is placed under the car, the interior of which is heated by sending in currents of air that pass through a fire-box in which fire-clay is heated to a white glow by means of coal oil.

The report of the Fortification Board submitted to the President estimates that \$126,000,000 will be required for an adequate system of coast defenses, and calls for the immediate appropriation of \$21,000,000 for plant wherewith to begin the manufacture of heavy ordnance.

The report of the State commission on the condition of the laboring classes in this city, more especially the occupants of tenement-houses, discloses hardships and privations in the struggle for bread which are a reproach to civilization, but the public ear is already wearied with exposures of this character, and relief is yet to come.

The Boston Chamber of Commerce has adopted a resolution declaring itself "in full sympathy with the movement of the New England Manufacturers' and Importers' Union and other business organizations to prevent fraud in the undervaluation of imports at custom houses."

Wm. E. Crandall, whose skill as a shipbuilder was shown in designing the steamer Pilgrim, died last Thursday in Newport, R. I.

Judge Brower, of the United States Circuit Court at Topeka, Kan., in a suit to recover the value of brewery property made useless by the prohibition law, decides that "when the right to use property in a given way is vested in a citizen it cannot be taken

from him for the public good without compensation. Beyond any doubt the State can prohibit the defendants from continuing their business of brewing, but before it can do so it must pay the value of the property destroyed."

A serious fire occurred in the cotton warehouses at Tompkinsville, Staten Island. The net loss on the contents is estimated at \$150,000.

The State Trades Association in session at Albany elected Samuel Gompers, of New York, president; secretary, Geo. A. Perry, of Rochester.

The ship Frank N. Thayer, from Manila to New York, was burned at sea with a cargo of hemp valued at \$250,000.

It is stated that a concession has been granted by the Swiss Government to a firm of electrical engineers at Geneva for making a railway up Mont Salève, near that place. The line will be made with a central rack very similar to that of the Rigi line, the toothed pinion which works into it being driven by machinery.

The New York Industrial Education Association are preparing for a Children's Industrial Exhibition, to be held in this city during the last week in March. This society professes to encourage and facilitate the training of children to use their hands in useful and ornamental work.

The bill appropriating \$450,000 for the purchase and alteration of the old Produce Exchange, in this city, for army purposes has passed both houses of Congress.

A company has been organized with a capital of \$15,000,000 to build a railroad from the head of Lake Superior to the Southwest, through Minnesota, Dakota and Nebraska, with a branch line to the Iowa coal fields.

The water rents in New York City for 1885 amounted to \$2,122,411.

The dynamite magazine of Flannigan & Co., at shaft 14 of the new aqueduct, blew up on Friday night and caused wide destruction. There were 250 pounds of dynamite in the magazine, which was connected by a steam-pipe with the engine-house of the shaft, about 200 feet away. The dynamite is kept frozen to increase its explosive powers, and when it is needed it is set near the steam-pipe and gradually thawed out. It is supposed that this pipe became too hot and caused the explosion.

According to Mr. Charles A. Ashburner, the geologist, the total oil products of Pennsylvania, including a small oil basin in southern New York, up to January 1, 1885, have been the enormous sum of \$61,000,000 barrels. The value of the product at \$1.65 $\frac{1}{2}$  per barrel, which has been the average price since the first discoveries were made, would sum up the enormous sum of \$426,000,000, a much larger sum than the present annual revenue of the United States. All this immense wealth has been obtained from an area of 369 square miles, divided into six basins or districts, having produced thus far 846,000 barrels to the square mile.

A remarkable explosion which occurred in Germany shows the force possessed by dust. A sack of flour, falling down stairs, opened and scattered the contents in a cloud through the lower room, where a burning gas-flame set fire to the dust, causing an explosion which lifted a part of the roof of the mill and broke almost all the windows.

Robert M. Hasbrouck, a prominent civil engineer, died at his residence on the 18th inst., at Schaghticoke, near Troy, aged 63 years. For a number of years he was engaged on the Erie Canal and Croton Aqueduct as engineer, and was one of the constructing engineers of the High Bridge. He was City Engineer of Troy for a long time, and for the past two years he has been Deputy State Engineer.

The Poughkeepsie Bridge Co., who have two piers partially built preparatory to crossing the Hudson River, propose to issue \$5,000,000 of bonds and complete the work. J. H. Appleton, of Springfield, Mass., is the new president.

Chief Engineer Church proposes to cover the new aqueduct for a distance of 31 miles from this city with a brick arch, to cost \$150,000 a mile.

A kerosene engine at Manchester, N. H., exploded and killed Timothy Stevens, the inventor.

The project of a submarine cable from San Francisco to Australia and New Zealand has been revived by an English syndicate, and Randolph Want, Solicitor General in London for the New South Wales Government, has arrived in San Francisco to await the arrival of his associates to further the project.

The West Shore ferry-house, at the foot of Forty second street, was burned on Sunday morning, causing a loss estimated at \$100,000. It was a frame structure covered with corrugated iron.

Dr. Elson, of the Health Board, is proceeding vigorously against the use of beer faucets or pipes made of brass, lead, copper or other dangerous metal. The orders which are being sent to liquor dealers specify no particular material for the faucets, but re-

quire that they shall not be made of any substance that will form unwholesome or deleterious compounds, according to Section No. 208 of the Sanitary Code.

The City of Chicago has 1100 miles of telegraph wire underground, and according to the city electrician the system is working successfully.

A number of Chinese have begun suit in the United States Circuit Court at San Francisco against the city of Eureka, for \$132,000 damages for losses of property alleged to have been sustained by them at the time of their expulsion from that place, nearly a year ago.

An explosion of gases in the coal mine at Newburg, W. Va., caused the instantaneous death of 39 men, whose bodies were disfigured beyond recognition.

The Ordnance Commission, of which Mr. Randall is chairman, it is thought will recommend a large appropriation for the purchase of steel ingots from American manufacturers, to be used in the construction of guns of 10 and 12 inch caliber at the Washington Navy-Yard and at the Watervliet Arsenal. The Commission think it best to make no larger contracts for the purchase of steel at the beginning than will be necessary to warrant manufacturers in putting up the plant necessary to cast ingots of the required dimensions. If the guns made therefrom prove satisfactory larger appropriations will no doubt follow.

Senator Warner Miller, it is reported, will soon introduce a bill invoking the aid of the National Treasury for enlarging the Erie Canal. He argues that, as the commerce of the canal is largely the products of other States, and the benefits are common to the States from which the products are shipped, the Government should assume the expense of its improvement and maintenance, but does not say that the State would be called upon to reciprocate the favor in much larger amounts.

Forty-one naval cadet engineers, who had graduated and afterward been dismissed from service by Secretary Chandler, were on Monday restored by order of the Supreme Court.

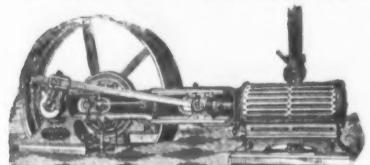
A Baltimore gas company, who use the latest patented processes, offer to sell their product at 50 cents per 1000 cubic feet.

The success of linseed culture in the Argentine Republic would seem to be assured. This season's crop in the valley of the Rio de la Plata will be 200,000 tons, and predictions are made that 1,000,000 tons will be raised during the coming twelvemonth.

The New York Board of Trade calls on the State Senate to investigate the telephone business, alleging that the charges in this city for the use of a telephone were from \$12.50 to \$15 per month, while the charge in Baltimore is from \$4 to \$7, in San Francisco it is \$5, and in New Haven from \$2.50 to \$6.

A steam bicycle has been built in California which has made from 12 to 15 miles per hour. It has a 51-inch driving-wheel, and an engine and boiler which weigh less than 20 pounds. These are mounted over the small wheel, which is run ahead of the larger one. With a proper engine, so it is claimed, there is no reason why one of these machines should not be

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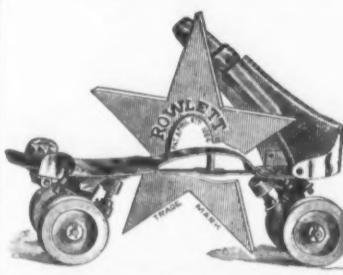
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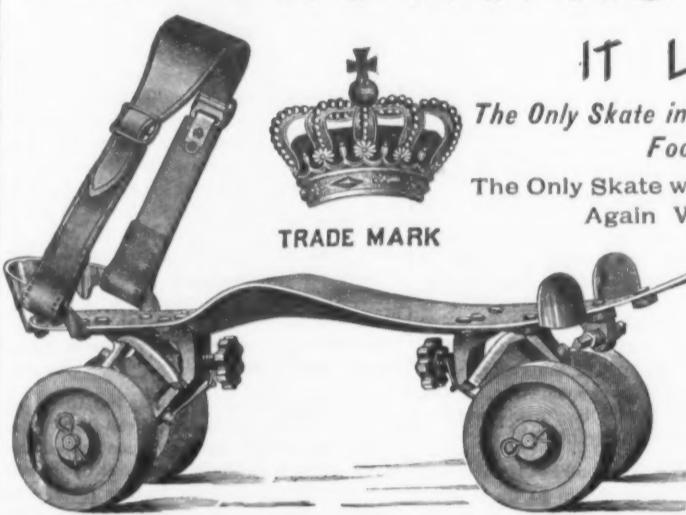
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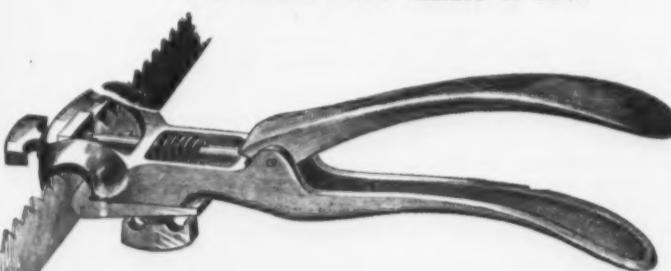
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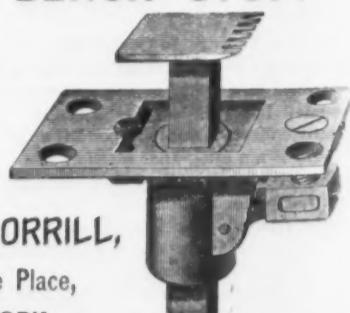
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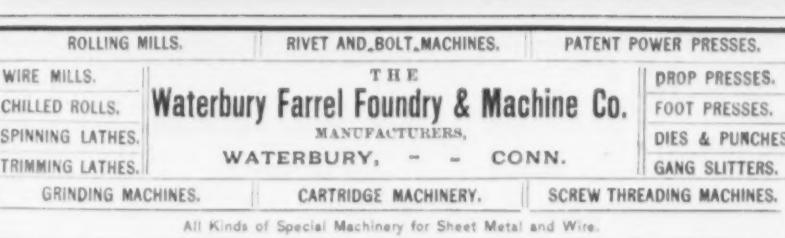
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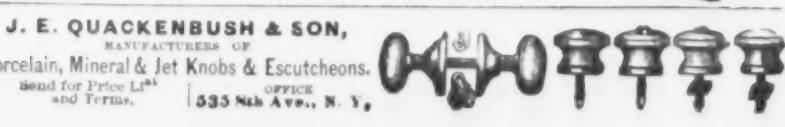
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## Foreign Markets.

### FRANCE.

PARIS, January 15, 1886.—**Metals.**—Our market has shown a moderate demand only during the week, sales being restricted to filling current consumptive requirements with a decline in Copper and an improvement in Lead. We quote at the close of the fortnight 10 francs per kg. Copper, 10½ francs per 100 lbs. Ingots and Slabs, 11½, Best Selected, 11½, and Pure Corocaro Ore, 10½. Tin, Banca, 255; Billiton, 247.25; Straits and Australian, 250, and English, 247.50. Lead, 31 @ 32, and Spelter, 40 @ 41.50. **Iron.**—Business has been picking up very slowly in the Iron trade in France, as is usually the case during the first fortnight of a new year, but from a general point of view the outlook has undergone no unfavorable change. We are all agreed that this year the Government will spend a great deal of money to carry out certain public works for which the funds have either been voted or will be, and that in this respect it will differ materially from last year, but we shall have to wait for milder weather ere anything can be undertaken, and till then we have only the private requirements to attend to, which so far are light, hence the price of Merchant still remains 13 francs ½ 100 kg. here. At St. Dizier manufacturer's yards have got 100 kg. lost in 3 to 4 francs ½ 100 kg. on all they sell, and have by common agreement raised the price sufficiently. Valenciennes still reports a dull market at 11 @ 12 francs for Merchant. Horseshoes are selling very low there, at 20 francs ½ 100 kg. Coal is less active here.—*Moniteur des Intérêts Matériels*

### BELGIUM.

BRUSSELS, January 15, 1886.—**Iron.**—The first fortnight of the new year has proved a disappointment so far as activity in the Iron trade in Belgium is concerned, but this ought not to disconcert us. The better feeling and increase of orders noticed last month were too encouraging to make us think they came to add to the gloom and doubt which characterized the greater part of 1885. Nor is anything changed since then; and we are fully aware that at prevailing low prices Holland and Java are anxious to go on buying the railroad material among us they stand in need of, because the money is all ready to push on the construction of railways there duly contracted for; the local demand we know will absorb this year about five times as much as in 1885, and other railways will be built as last year. If not sooner, March will bring us new commands from there and other sources, while the usual consumption of the country will expand as we approach spring. A question much debated during the week, not only in the Chambers, but also in public, is the question of lowering the freight on Domestic Pig Iron sufficiently to enable it to compete with English and other foreign without a protective duty. Since we have the Government railroad we may as well enjoy the benefit of low freight on our wares. The Coal trade is satisfactory throughout; the demand is larger than usual and prices are well upheld.—*Moniteur Industriel*.

### GERMANY.

HAMBURG, January 15, 1886.—**Iron.**—The improvement in Pig Iron continues, although in some instances it does not extend beyond sustaining prices. The demand for Spiegel both for home use and export has been unabated, and prices are still steadily rising. Both Spiegel and Puddling Pig are being exported from Rhenish-Westphalia on a satisfactory scale, and of the latter consumers have most of them now laid in a supply for the first quarter, but we do not share the demand, as stocks are reduced to a mere trifle in their hands in many instances. Both Bessemer and Thomas have been fully sustained. As meanwhile foundries complain of a lack of work Foundry Pig has been weak. The rolling mill branch can show little so far to boast of; prices are, perhaps, a little firmer for Finished Iron, but they certainly are no higher. The few orders received have been at extremely low limits, say 60 ½ 100 kg. for Bar Iron. Beam iron below the Hoop is still getting down, and Thin Sheets, in spite of better prospects, have not improved in price; this shows that the demand from Boiler-Makers is still light, and Thin Sheets are depressed quite as much. Merchant Iron is stagnant for the moment. A good opinion is meanwhile entertained of Wire Rods and Wire Nails, and there are plenty of buyers wishing to buy ahead; January is the month when the demand for these usually increases. Steel Rails may be quoted 140 marks. **Metals.**—Have been neglected and are without any outspoken tendency.—*Borsenblatt*.

### HOLLAND

ROTTERDAM, January 10, 1886.—**Tin.**—The market has displayed great firmness at 56 @ 56.25 guilders ½ 100 kg. for Billiton, while Banca is still obtainable at 57.

### Tin Statistics.

	Nov. 30,	Dec. 31,	Dec. 31,
	1885.	1885.	1884.
	Slabs.	Slabs.	Slabs.
Banca stock on warrants, Billiton stock in Holland.	30,065	23,300	36,976
	30,568	18,463	35,800
Total.	50,638	41,668	72,776
November and December deliveries of Banca.	10,300	6,865	8,256
November and December deliveries of Billiton.	8,300	8,165	6,440
Total.	18,600	15,030	14,696
Banca deliveries since January 1.	123,608	190,473	120,189
Billiton deliveries since January 1.	106,504	114,069	104,050
Banca afloat.	1,000	3,860	23,034
Banca stock with Netherland Trading Co.	70,911	74,406	80,938
Billiton afloat.	21,260	31,490	38,500
Price of Banca.	56½ fr.	56½ fr.	46 fr.
Price of Billiton.	56½ fr.	56½ fr.	45 fr.
Koch & Vlierboom.			

### SPAIN.

MADRID, January 13, 1886.—**Metals.**—As per Government returns the shipments from Spain during the first 10 months were as follows:

	1885.	1884.	1885.
	Tons.	Tons.	Tons.
Calamine.	27,764	34,735	31,400
Pyrites.	481,597	508,967	659,148
Iron Ore.	3,558,261	3,363,108	3,357,116
Lead.	19,446	19,000	19,500
Copper.	1,948	1,179	1,002
Quicksilver.	102,994	98,969	97,961
Total.	4,190,418	4,008,954	4,169,623

Iron Ore shipments from Bilbao during the past eight years:

	Coast-Abrd.	Coast-Abrd.
	Tons.	Tons.
1885.	3,295,982	34,598
1886.	3,155,428	41,116
1887.	3,378,284	49,953
1888.	3,622,548	44,634

There has been a large business done at Bilbao during the fortnight, especially in good Red Ore, Campanil selling at 6½ @ 7 spot and futures; superior at 6½, and the lower sorts at 6¾.—*Revista Minera*.

### EST INDIES.

PEKING, December 9, 1885.—**Tin.**—The market opened a fortnight ago at 51½, and closes at 51½. Receipts sum up 900 piculs. Europeans trade during 780, and Chinese, 2700. Total shipments hence during the first 11 months, 138,511 piculs to England; 1344 to the Continent, and 17,408 to the United States.—*Schmidt, Kussermann & Co.*

COLOMBIA, December 4, 1885.—**Plumbago.**—Has been quiet and steady, large lumps at £13.10/- cost and freight; ordinary £12.10/- chips, £12.60, and dust, £12.12.6, with 5/- less if by sailing vessel.—*Volkart Brothers*.

VALPARAISO, November 27, 1885.—**Copper.**—Opened a fortnight ago at \$15.80 ½ 100 lb. cost for ordinary bars, and under the influence of favorable cable news advanced to \$17, in order to close at \$16.80. Sales 25,000 quintals at \$15.80 @ \$16.80; \$16.80 is equal to £24.15/- with a steamer freight of 30/- and 25% exchange. **Nitrate.**—At the Iquique meeting of the 2nd inst. the combination

was continued till the close of next year. The amount to be produced in 1886 was fixed at 10,000,000 quintals, with the proviso that by mutual agreement it may later on be increased. After the result of the meeting transpired there was a better demand for December shipment, but only one cargo sold at \$3.35 for 95%. January and February shipment sold at \$3.35 @ \$3.40, but higher prices are insisted upon. Sales aggregate 181,400 quintals for the fortnight. The price of \$3.40 equals 10½ d. Coal has been very quiet at 20. Orell, 22 @ 23 West Hartley, and 19 @ 20 Australian. Exchange 90 days, London, 25½ d.—Weber & Co.

### AUSTRIA.

VIENNA, January 10, 1886.—**Iron.**—It had been confidently hoped that after stocks were taken and balance sheets drawn there would be some revival in the Iron trade, but we perceive no indication yet, nor do we expect a better tone and demand than present. The market is expected to curtail the output. After a while stocks will have to be replenished, orders for railroad material will be received and building in the great cities recommended, but six weeks may pass ere we see much of all this. Meanwhile the Iron market is dull and unaltered.—*Austrian Trade Journal*.

## SCIENTIFIC AND TECHNICAL

### The Effect of the Genesis of Coal Upon its Properties.

A question widely discussed at times by geologists has been whether the diversity of the fossils, from which our present coal seams originated, has had any effect upon the chemical composition or the physical properties of the coal. Some have held that such must be the case; others have urged that the circumstances attending carbonization so much preponderated in their influence that the character of the fossil plants was entirely crowded into the background. Mr. Ad. Carnot has attempted to solve this problem experimentally. Carefully chosen samples of different fossil plants, whose structure was well preserved, were analyzed with the following results:

	Car-	Hydro-	Oxy-	Nitro-
	bon.	gen.	gen.	gen.
Calamodrudron	82.95	4.78	11.89	0.58
Cordaites	82.84	4.98	11.44	0.44
Lepidodendron	83.28	4.88	11.45	0.39
Psaronius	81.64	4.80	13.2	0.44

**Ptychopteris** . . . . . 80.62 4.80 14.53  
**Megaphyllum** . . . . . 83.37 4.40 12.23

Elementary analysis therefore showed nearly no difference in the composition of the different fossil plants, but quite another state of affairs was reached in conducting a series of distilling tests. Deducting moisture and ash, the following average values were found:

	Volatile	Solid	Character
	matter.	residue.</th	

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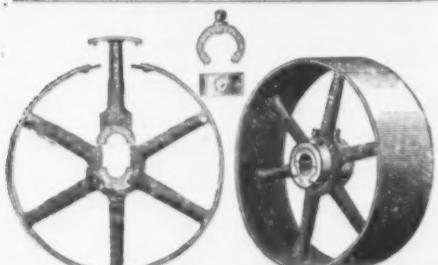
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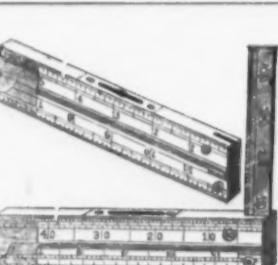
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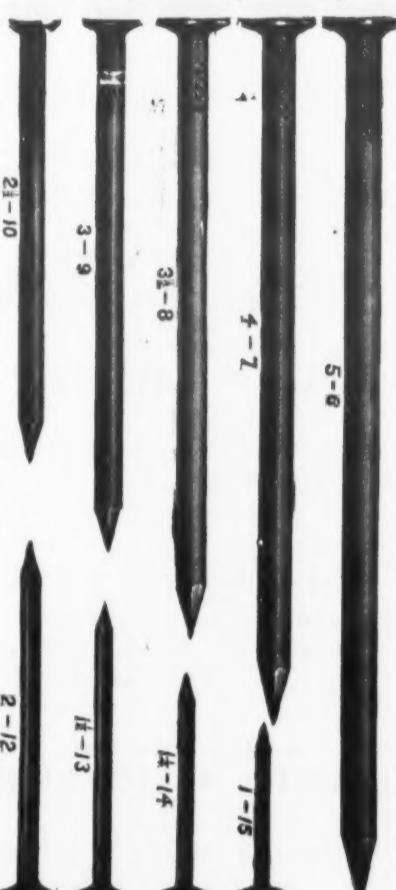
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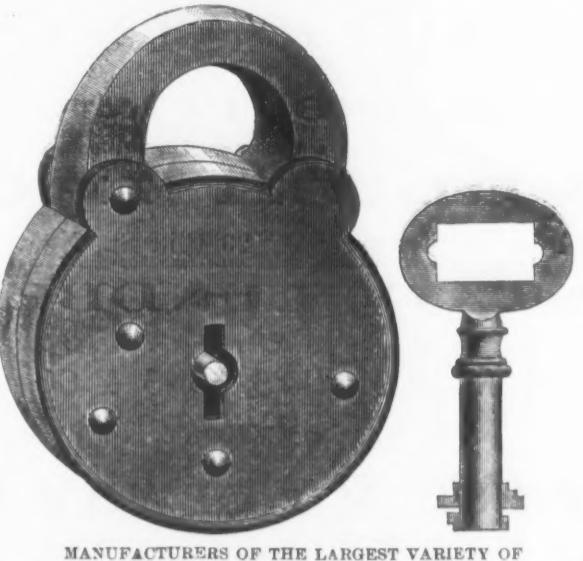
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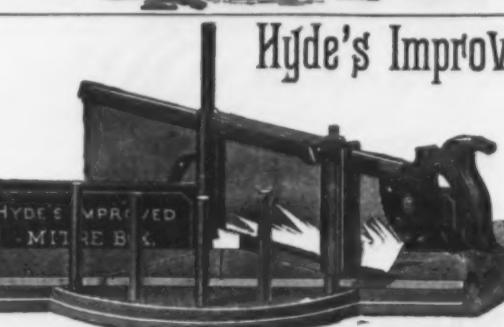
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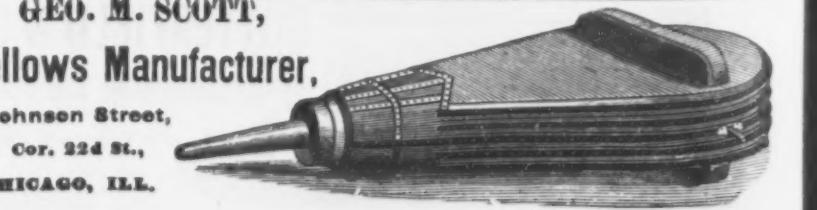
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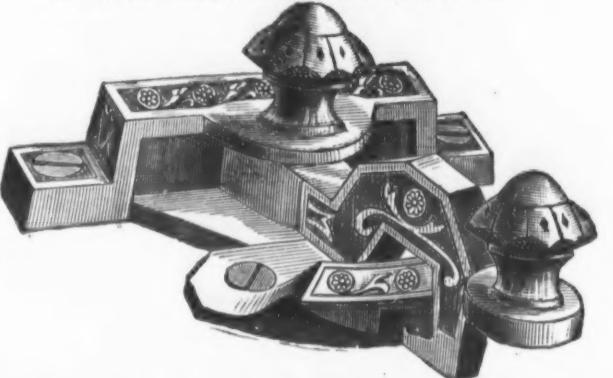
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Bird Cage—

Brainerd, M. B. & D., reduced list, 1879.....

dis. 40 50

Bird Cage—

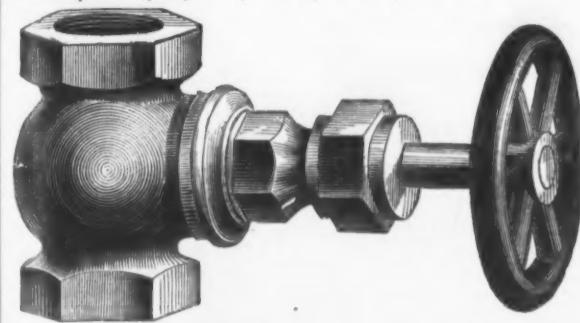
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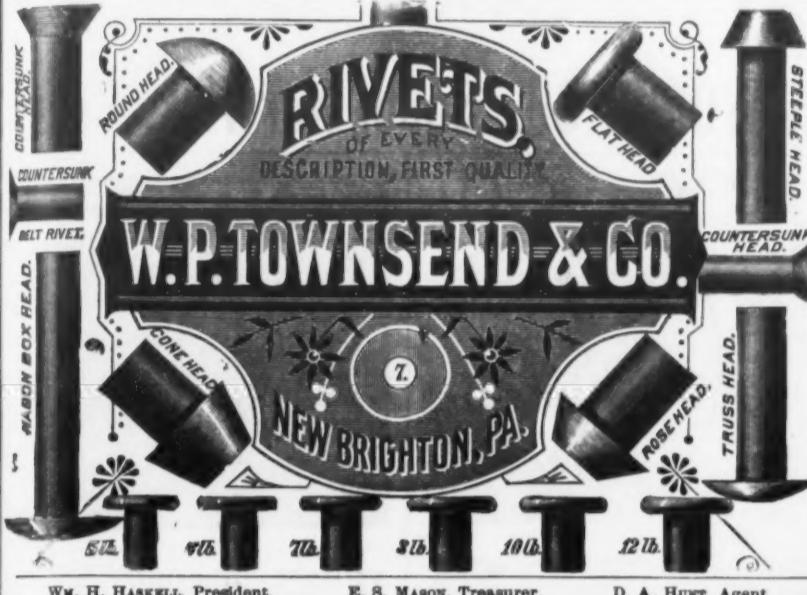


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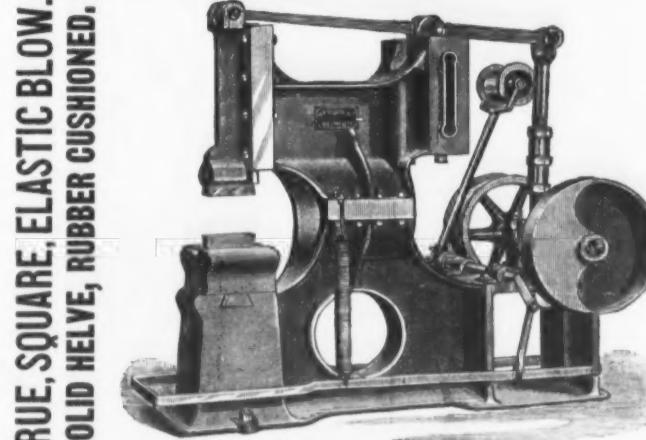
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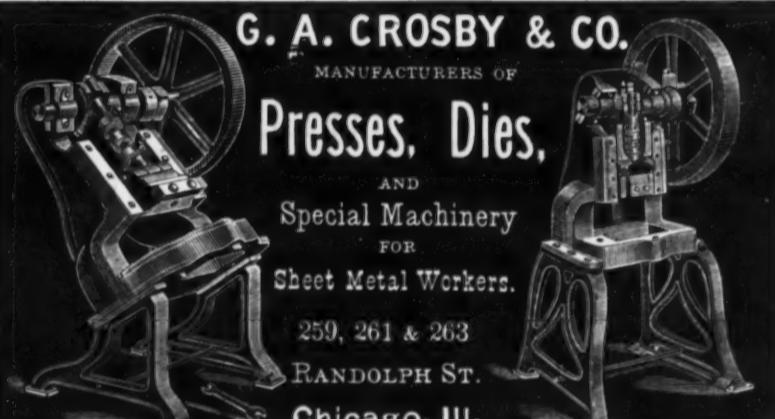
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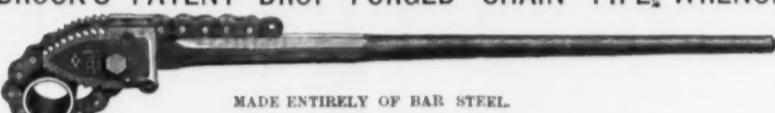
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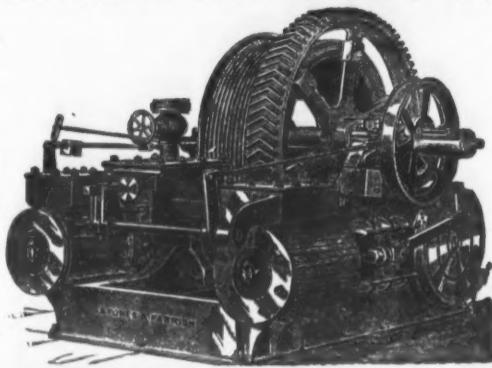
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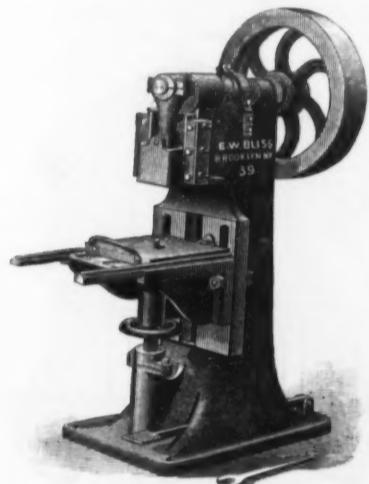
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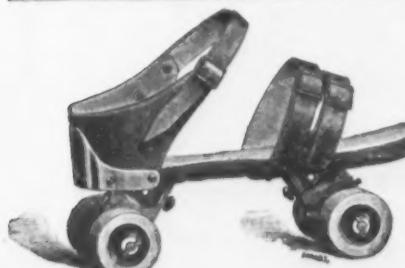
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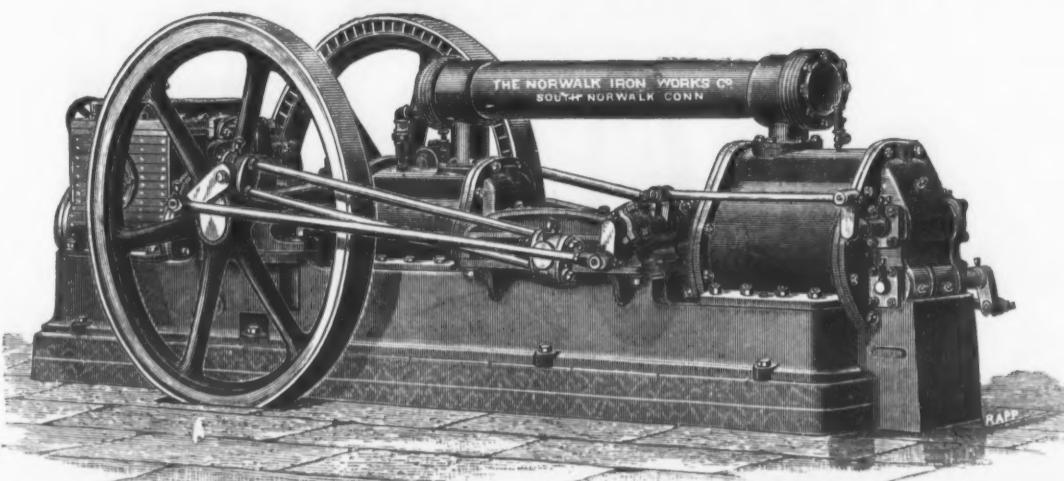


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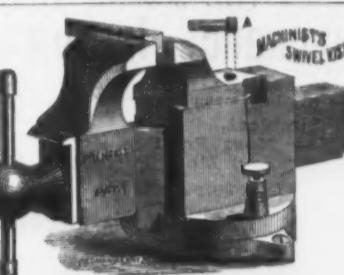
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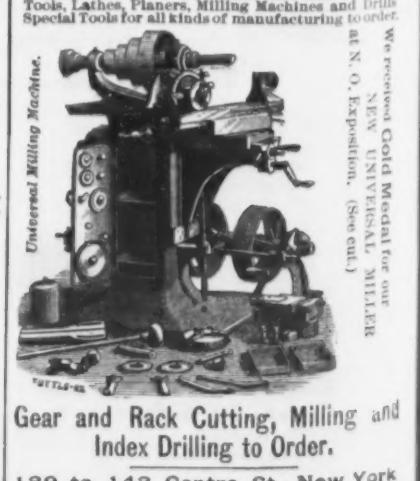
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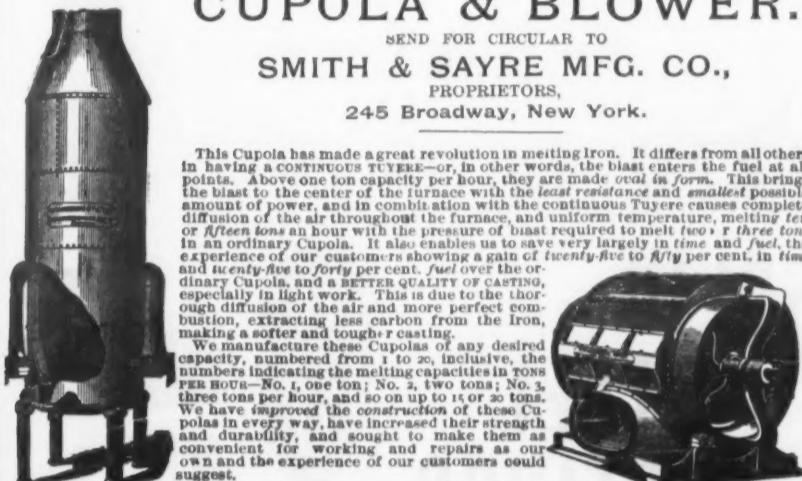
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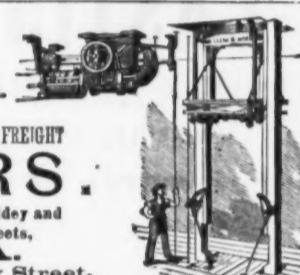
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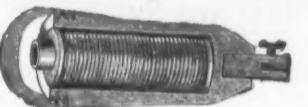
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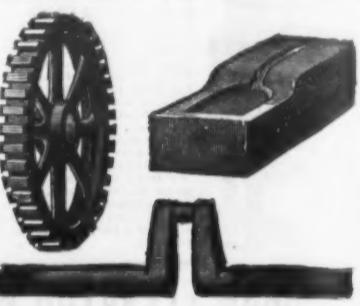
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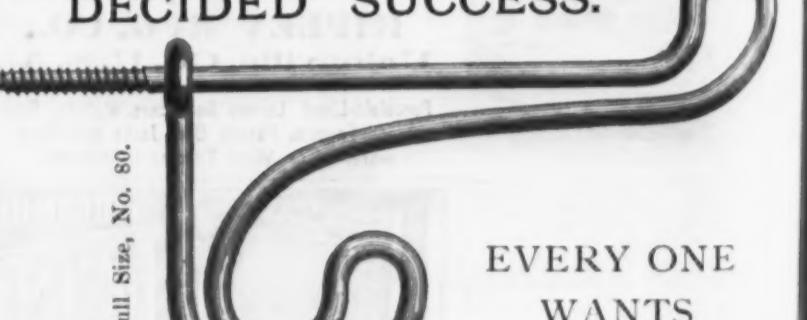
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